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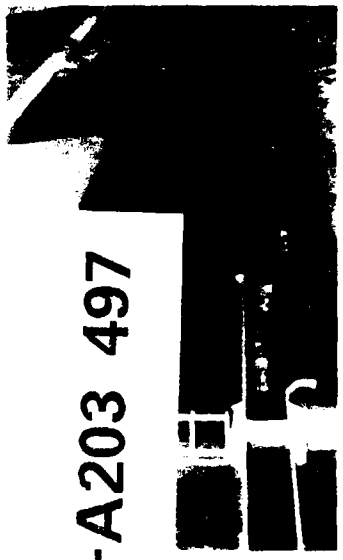

HYDRAULICS LABORATORY

TECHNICAL REPORT HL-88-29

WAX LAKE OUTLET CONTROL STRUCTURE ATCHAFALAYA RIVER

Hydraulic Model Investigation

by

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Hydraulics Laboratory

DEPARTMENT OF THE ARMY
Waterways Experiment Station, Corps of Engineers
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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This investigation was concerned with the development of plans for a stone control structure in Six Mile Lake to maintain a flow distribution of 70 percent down the Atchafalaya River toward Morgan City, LA, and 30 percent down Six Mile Lake to the Wax Lake Outlet channel for nonflood periods, less than 550,000 cfs Atchafalaya Basin discharge.

The study indicated that the desired flow distribution could be obtained with a stone structure in Six Mile Lake connected to the West and South Protection Levees by earthen overflow levees. The stone structure began at the right bank end of the earthen levee, sta 17+00, extended for 332.5 ft to sta 20+32.5 at el 11.3 with a 30-ft crown, sloping down at 1V on 10H to el 7.5 at sta 20+70.5, continuing at el 7.5 with a 30-ft crown for 1,100 ft to sta 31+70.5, sloping down to el -2.0 at sta 32+00.5, continuing for

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19. ABSTRACT (Continued).

1,100 ft at el -2.0 with a 10-ft crown to sta 43+00.5, sloping up to el 11.3 at sta 43+45.5, continuing at el 11.3 with a 30-ft crown for 354.5 ft to tie in to the earthen Cypress Island cutoff levee at sta 47+00. The stone structure had side slopes of 1V on 3H on the upstream face and 1V on 4H on the downstream face. Stability berms that extended 181.5 ft upstream and 200 ft downstream of the axis of the structure were placed at el -5.0 from sta 17+38 to 46+62. The earthen levee on the right bank was constructed at el 11.3 and the levee on Cypress Island was constructed at el 10.8.

This structure produced flow distributions ranging from 27 percent at the lower flows to about 35 percent for flows near 550,000 cfs. Velocities ranged from about 12 fps in the notch to 9 fps 1,000 ft below the axis of the structure. This was the nearest to the desired 70-30 percent distribution with the lowest velocities of all plans tested.

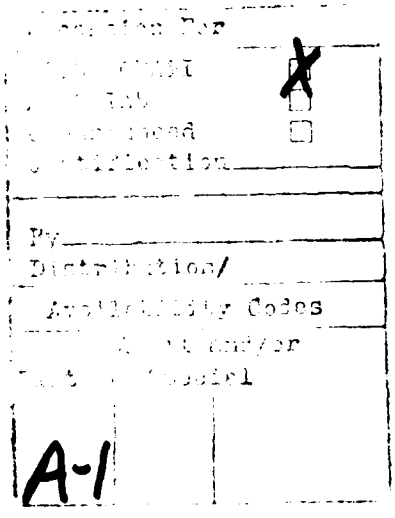
PREFACE

The model investigation reported herein was conducted for the US Army Engineer District, New Orleans (NOD), in the Hydraulics Laboratory of the US Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi."

The investigation was conducted during the period October 1984 to November 1986 under the general supervision of Mr. F. A. Herrmann, Jr., Chief, Hydraulics Laboratory; and under the direct supervision of Mr. J. E. Glover, Chief, Waterways Division, Hydraulics Laboratory. The engineer in immediate charge of the investigation was Mr. T. J. Pokrefke, Jr., assisted by Messrs. C. R. Nickles and R. K. Anglin, and Miss K. Anderson-Smith, all of the Waterways Division, Potamology Branch, Hydraulics Laboratory. This report was prepared by Messrs. Nickles and Pofrefke and edited by Mrs. N. Johnson, Information Technology Laboratory, under the Inter-Governmental Personnel Act.

During the course of the model study, NOD was kept informed of the progress of the study through monthly progress reports and interim test results. Messrs. F. Chatry, C. Soileau, B. Garrett, and A. Laurent of NOD made frequent visits to WES to observe model tests, discuss test results, and coordinate the testing program.

COL Dwayne G. Lee, EN, is the Commander and Director of WES.
Dr. Robert W. Whalin is the Technical Director.



CONTENTS

CONVERSION FACTORS, NON-SI TO SI (METRIC)
UNITS OF MEASUREMENT

Non-SI units of measurement used in this report can be converted to SI (metric) units as follows:

Multiply	By	To Obtain
cubic feet	0.02831685	cubic metres
feet	0.3048	metres
miles (US statute)	1.609344	kilometres

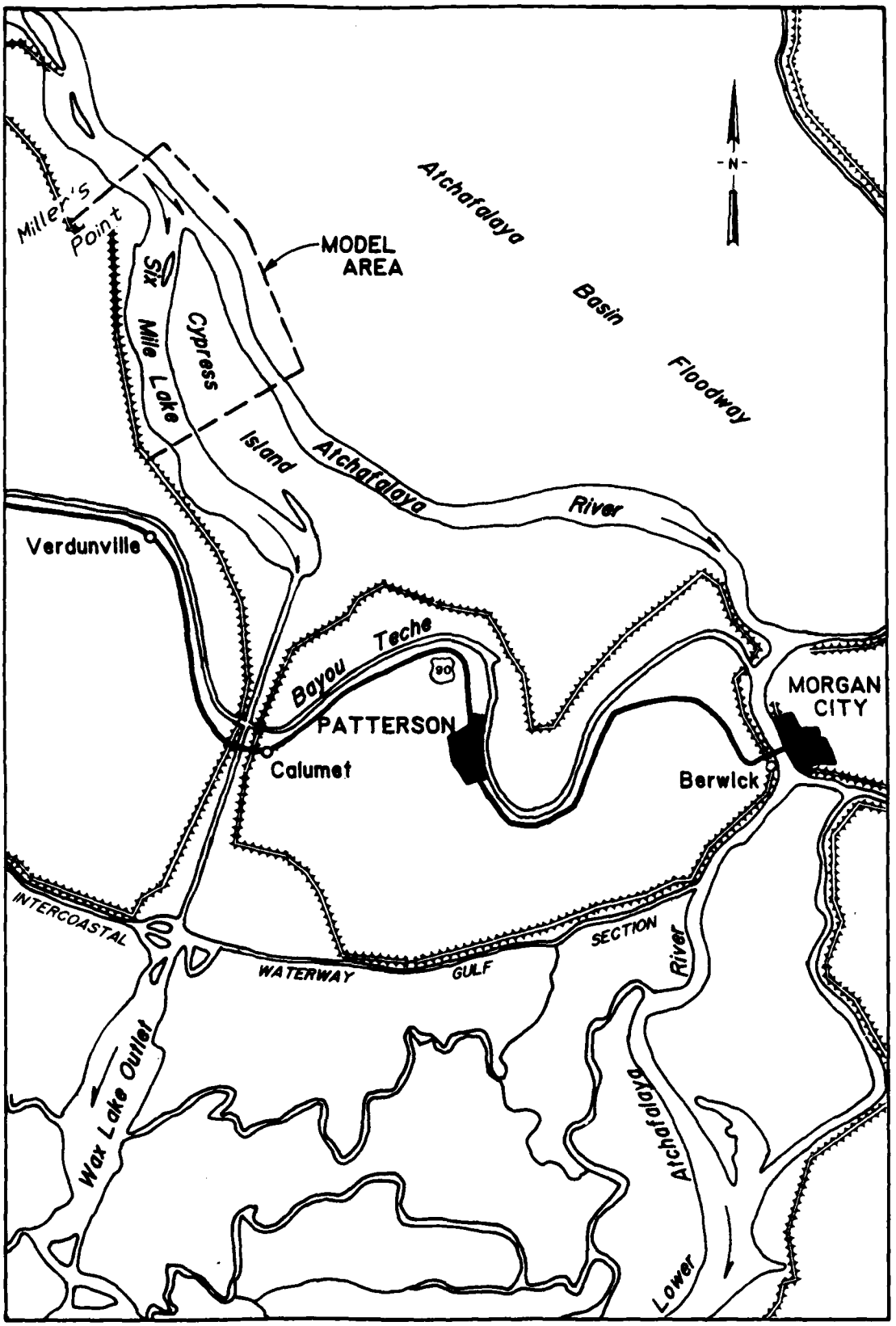


Figure 1. Location map

WAX LAKE OUTLET CONTROL STRUCTURE, ATCHAFALAYA RIVER

Hydraulic Model Investigation

PART I: INTRODUCTION

Description of Problem

1. The Wax Lake Outlet channel is a dredged channel from the south end of Six Mile Lake to Wax Lake (Figure 1), which diverts flood flows on the Atchafalaya River directly to the Gulf of Mexico, thus reducing flood stages at Morgan City, Louisiana. Since its construction, the channel has increased in capacity for flows below flood stages thus decreasing the discharges past Morgan City during nonflood periods.

Purpose of Model Study

2. The purpose of this model study was to determine the effectiveness of a stone control structure in Six Mile Lake, which is the beginning of the Wax Lake Outlet Flood Control Channel, to maintain a flow distribution of 70 percent down the Atchafalaya River toward Morgan City and 30 percent down Six Mile Lake to the Wax Lake Outlet channel for nonflood periods, less than 550,000 cfs Atchafalaya Basin discharge. Tests were conducted in a separate model study* of the proposed structure to determine a riprap size and gradation that would be stable for anticipated flows, define flow characteristics through the structure, and determine discharge coefficients for free-flow and submerged-flow conditions.

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* Robert A. Davidson. 1988 (Sep). "Wax Lake Outlet Control Structure, Louisiana; Hydraulic Model Investigation," Technical Report HL-88-23, US Army Engineer Waterways Experiment Station, Vicksburg, MS.

PART II: MODEL

Description

3. The model used in this investigation was a scale reproduction of approximately 5.5 miles* of the Atchafalaya River, beginning about 1.7 miles upstream of the head of Cypress Island, near Miller's Point, Louisiana, and approximately 4.8 miles of Six Mile Lake below the head of Cypress Island. The model was constructed to an undistorted scale of 1:120 and was of the fixed- bed type molded in sand cement mortar. The channel configuration, Cypress Island, and overbank area topography were compiled from 1976 prototype cross-section data and US Geological Survey quadrangle maps of the area (Plate 1). Folded strips of mesh wire were used to simulate the roughness effect of trees and underbrush on the overbank and Cypress Island.

Appurtenances

4. Water was supplied to the model by two 10-cfs centrifugal flow pumps operating in a circulating system and was measured at the upstream end of the model by three venturi meters of different sizes to provide for accurate measurement of flow over the range of discharges to be reproduced. Water-surface elevations along the channels were measured by 22 piezometers located in the channels (Plate 1) and connected to gage buckets in a gage pit along the edge of the model. Water-surface elevations and discharge distribution between the Atchafalaya River and the Six Mile Lake channels were controlled by adjustable tailgates at the end of each channel.

5. Velocities and current directions were determined in the model by means of wooden floats weighted on one end to draft 3 ft prototype. Velocities were determined by timing the travel of the floats over a measured distance. Current directions were ascertained by plotting the paths of the floats with respect to ranges established on the model.

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* A table of factors for converting non-SI units of measurement to SI (metric) units is presented on page 3.

PART III: TEST AND RESULTS

Test Procedures

6. Tests of all plans were conducted for Atchafalaya Basin discharges of 145,200, 322,600, 464,500, 619,400, 892,500, and 1,548,400 cfs. The discharges introduced at the head of the model were computed by reducing the Atchafalaya Basin discharges by 7.0 percent to compensate for the flow down the East Access Channel that reenters the river downstream of the modeled area. This resulted in discharges of 135,000; 300,000; 432,000; 576,000; 830,000; and 1,440,000 cfs to be tested in the model. Current direction and velocities, water-surface profiles, and flow distribution between the Atchafalaya River and Six Mile Lake below the head of Cypress Island were obtained for all test conditions for comparision of the effects of each plan. The distribution of flow between the Atchafalaya River and Six Mile Lake was obtained from prototype stage-discharge relationships for Simmesport, Morgan City, and Wax Lake Outlet at Calumet. The percentages of the Miller's Point discharge (model inflow) flowing down Six Mile Lake, obtained from these relationships, were as follows:

Discharge at Miller's Point, cfs	Discharge down Six Mile Lake, cfs	Percentage of Flow
135,000	57,000	42.2
300,000	132,000	44.0
432,000	180,000	41.7
576,000	222,000	38.5
830,000	297,000	35.8
1,440,000	478,000	33.2

Water surfaces in the model were controlled to match the stage-discharge relationship in Six Mile Lake for the Verdunville, Louisiana, prototype gage.

Base Test

Description

7. Before any proposed structure plans were tested, base conditions without a structure in place were determined to be compared with the test results of proposed structures. Base tests were conducted for the six discharges described earlier.

Results

8. Test results of discharge distribution, shown in Table 1, indicated the model would reproduce the flow distributions obtained in the prototype (paragraph 6). Water-surface elevations for base tests are listed in Tables 2-7. Results of velocity and current direction measurements, shown in Plates 2-7, indicated the following maximum velocities in the area of the proposed control structure:

Miller's Point Discharge, cfs	Maximum Velocity, fps
135,000	1.8
300,000	2.9
432,000	3.9
576,000	4.2
830,000	5.2
1,440,000	5.9

Original Design

Description

9. The original design, furnished by the US Army Engineer District, New Orleans, consisted of a stone control structure in Six Mile Lake connected to the West Atchafalaya Protection Levee (WAPL) and the South Atchafalaya Protection Levee (SAPL) by earthen overflow levees. The Wax Lake Outlet Control Structure (WLOCS) alignment is shown in Plate 8. The stone control structure in Six Mile Lake (Plate 9) began at WLOCS sta 17+00 at el 11.3,* sloped down at 1V on 10H to el 7.5 at sta 17+38, continued at el 7.5 for 987 ft to sta 27+25, sloped down at 1V on 4H to el -5.0 at sta 27+75, continued at el -5.0 for 850 ft to sta 36+25, sloped up at 1V on 4H to el 7.5 at sta 36+75, continued at el 7.5 for 987 ft to sta 46+62, and sloped up at 1V on 10H to el 11.3 at sta 47+00. The el 7.5 weir sections were constructed with crown widths of 30 ft and side slopes of 1V on 3H upstream and 1V on 4H downstream. Stability berms that extended 181.5 ft upstream and 200 ft downstream of the axis of the structure were placed at el -5.0 from sta 17+38 to 46+62. The structure was connected to the WAPL (sta 0+00 to 17+00) and to the model limits (sta 47+00 to 253+51.3) with overflow levees with 10-ft crown widths. The levee from sta 0+00 to 17+00 was constructed at el 11.3 and the levee on

* All elevations (el) and stages cited herein are in feet referred to the National Geodetic Vertical Datum (NGVD).

Cypress Island was constructed beginning at sta 47+00 to 53+90 at el 11.3, then decreasing in elevation to approximately el 10.9 at the model limits (sta 253+51.3).

Results

10. Discharge distribution measurements, shown in Table 1, indicated the discharge through Six Mile Lake was reduced to 28.1, 32.6, 33.2, 36.2, and 37.1 percent for the 135,000 cfs through the 830,000-cfs flows, respectively. Due to the reduction of flow from Six Mile Lake toward the Atchafalaya River below the control structure caused by the cutoff levee on Cypress Island, the discharge down Six Mile Lake for the 1,440,000-cfs flow was increased to 35.1 percent. It should also be noted that the cutoff levee caused ponding of water on the upstream portion of Cypress Island following a high flow since the internal drainage on the island was changed. Results of water surface measurements indicated the maximum head differentials across the structure were 3.0 ft for the 300,000-cfs discharge and 2.7 ft for the 432,000-cfs discharge. Results of velocity and current direction measurements, shown in Plates 10-12 and listed in the following tabulation, indicated the velocities downstream of the structure were probably high enough to cause scour downstream of the el -5.0 berms, and the location of the notch relative to the alignment of flow in the channel caused excessive end contractions at the notch. Maximum velocities in the notch, and 500 and 1,000 ft downstream of the axis of the structure were:

Miller's Point Discharge, cfs	Maximum Velocities, fps		
	Notch	500 ft Downstream	1,000 ft Downstream
135,000	11.0	7.8	6.1
300,000	13.2	13.1	11.7
432,000	13.5	12.2	12.3
576,000	11.0	10.7	11.2
830,000	7.0	6.6	6.0
1,440,000	6.9	6.1	5.7

The velocities in the notch of the structure are measured from 250 ft upstream to 250 ft downstream of the axis; therefore, local velocities along the axis could be expected to be higher than those in this study.

Plan A

Description

11. Plan A was the same as the original design except the structure in Six Mile Lake channel was modified. The notch in the structure was widened to reduce the velocities downstream of the structure, and the elevation of the crest was raised to compensate for the additional width of the notch for discharge control. The modifications to the structure consisted of extending the right cutoff levee 333.5 ft from sta 17+00 to sta 20+33.5 at el 11.3 with a crown width of 30 ft sloping down at 1V on 5H to el -2.0 at sta 21+00, continuing at el -2.0 with a 10-ft crown width for 2,200 ft to sta 43+00, sloping up at 1V on 5H to el 11.3 at sta 43+66.5, and continuing at el 11.3 with a 30-ft crown for 333.5 ft to tie into the Cypress Island cutoff levee at sta 47+00. The structure side slopes and the el -5.0 berms were the same as in the original design.

Results

12. When the model was operated using the 300,000-cfs discharge, the results of discharge measurements in Six Mile Lake indicated the distribution of flow would be higher than desired; therefore, additional testing of the plan was suspended. Preliminary tests were conducted on various changes to the structure to develop a design that would produce the desired flow distribution of 30 percent at 300,000-cfs discharge and then checked for the 135,000-, 432,000-, and 576,000-cfs discharges. These preliminary tests were used to develop Plan A-1.

Plan A-1

Description

13. Plan A-1 (Plate 13) was the same as Plan A except for a modification to the structure in the Six Mile Lake channel. The modified structure (Plate 14) consisted of extending the right cutoff levee from sta 17+00 for 332.5 ft to sta 20+32.5 at el 11.3 with a 30-ft crown, sloping down at 1V on 10H to el 7.5 at sta 20+70.5, continuing at el 7.5 with a 30-ft crown for 1,100 ft to sta 31+70.5, sloping down at 1V on 4H to el 0.0 at sta 32+00.5, continuing for 1,100 ft at el 0.0 with a 10-ft crown to sta 43+00.5, sloping up at 1V on 4H to el 11.3 at sta 43+45.5, continuing at el 11.3 with a 30-ft

crown for 354.5 ft to tie into the Cypress Island cutoff levee at sta 47+00. This alignment positioned the notch adjacent to the left bank in an effort to reduce the contraction of flow through the notch. The cutoff levees, the el -5.0 berms, and the structure side slopes were the same as in original design and Plan A.

Results

14. Discharge distribution measurements (Table 1) indicated the following flow distribution in Six Mile Lake reduced from the base test percentages:

Discharge cfs	Flow Distribution percent	Decrease from Original design percent
135,000	20.2	7.9
300,000	30.3	2.3
432,000	32.2	1.0
576,000	36.2	0.0
830,000	36.1	1.0
1,440,000	35.0	0.1

The 576,000-cfs distribution was the same in both Plan A-1 and the original design. The distributions of the 830,000- and 1,440,000-cfs flows were approximately the same as obtained with the original design. The discharge for the 135,000-cfs flow was well below the 30 percent desired distribution, and the structure controlled the discharge diverted into Six Mile Lake for the 576,000-cfs flow which is higher than the 550,000-cfs basin discharge at which no control is desired. Velocities and current direction results (Plates 15-20) indicated the following maximum velocities in the notch, and 500 and 1,000 ft downstream of the axis of the structure:

	Maximum Velocities, fps		
Miller's Point Discharge, cfs	Notch	500 ft Downstream	1,000 ft Downstream
135,000	5.2	4.2	2.4
300,000	9.9	9.2	7.8
432,000	9.5	10.0	7.7
576,000	9.7	11.2	8.8
830,000	9.3	8.5	7.4
1,440,000	9.3	7.9	6.3

The maximum velocities recorded in the notch were approximately 2 to 4 fps less for the 135,000, 300,000, 432,000, and 576,000 cfs, but were about 2 fps higher for the 830,000- and 1,440,000-cfs flows than those recorded with the

original design. Results of water surface profile measurements, shown in Tables 2-7, indicated the maximum head through the structure was 3.5 ft with the 300,000-cfs discharge.

Plan A-2

Description

15. Plan A-2 was the same as Plan A-1, except the section of the structure from sta 32+00.5 to sta 43+00.5 was lowered from el 0.0 to el -2.0 (Plate 21). The notch was lowered 2 ft in an effort to reduce the control of the structure on the discharge diverted for the 135,000- and 576,000-cfs flows.

Results

16. Discharge distributions measurements (Table 1) indicate the following flow distributions through Six Mile Lake:

Discharge cfs	Flow Distribution percent	percent
135,000	27.1	+6.9
300,000	31.6	+1.3
432,000	33.1	+0.9
576,000	36.2	0.0
830,000	36.4	+0.3
1,440,000	34.5	-0.5

The Plan A-2 structure, as in Plan A-1, produced some slight control of the diverted discharge for the 576,000-cfs flow, but increased the diverted discharge for 135,000-cfs flow nearer the desired 30-percent distribution. Current directions and velocities, shown in Plates 22-27 and listed in the following tabulation, indicated the velocities 500 ft downstream of the structure were approximately the same as in Plan A-1; but the velocities 1,000 ft downstream were increased for all flows except the 300,000-, 576,000-, and 830,000-cfs discharges. The maximum velocities in the notch, and 500 and 1,000 ft downstream of the axis of the structure were:

Miller's Point Discharge, cfs	Maximum Velocities, fps		
	Notch	500 ft Downstream	1,000 ft Downstream
135,000	6.3	4.8	2.9
300,000	11.0	9.5	7.0
432,000	10.5	10.0	9.3
576,000	11.8	10.5	8.1
830,000	8.0	7.4	6.7
1,440,000	8.6	7.8	7.3

Maximum velocities recorded in the notch for the 135,000- through 576,000-cfs discharges showed an increase of 1.0 to 2.0 fps. Results of water surface profile measurements (Tables 2-7) indicated maximum head differentials through the structure were 1.0 to 2.5 ft less than those obtained with Plan A-1. The higher velocities 1,000 ft below the structure indicated some protection further downstream would be required.

Plan A-2 Modified

Description

17. Plan A-2 Modified was the same as Plan A-2, except the cutoff levee on Cypress Island, beginning at sta 53+90, was lowered 0.5 ft to eliminate all control of discharge diverted into Six Mile Lake for the 576,000-cfs flow.

Results

18. Plan A-2 Modified was not tested with the 135,000- or 300,000-cfs flows because the cutoff levee does not affect the discharge diverted for flows below 432,000-cfs. Results of discharge distribution measurements, shown in Tables 4-7, indicated the distribution of discharge was approximately the same for the 432,000-cfs flow and only 0.8 percent higher for the 576,000-cfs flow compared with the results obtained in Plan A-2. The distribution remained approximately the same for the 830,000- and 1,440,000-cfs flows. This plan, as with Plan A-2, produced some slight control of the discharge diverted into Six Mile Lake, but it should be noted that the model reproduces only approximately 2 miles of the cutoff levee, which is approximately 5.3 miles long. This length is considered insufficient for a complete evaluation of the effects of lowering the entire cutoff levee 0.5 ft; therefore, the discharge distributions at the Wax Lake Outlet channel could be somewhat different than those measured in the model. Current directions and velocities were not obtained for Plan A-2 Modified because the changes in discharge were not enough to measurably change the velocities in Six Mile Lake.

PART IV: DISCUSSION OF RESULTS AND CONCLUSIONS

Limitations of Model Results

19. Analysis of the results of this investigation is based on a study of water-surface elevations, discharge measurements, current directions, and velocities. An evaluation of test results should consider that small changes in current directions and velocities are not necessarily changes produced by the structure, because several floats introduced at the same point may follow different paths and move at somewhat different velocities due to pulsating currents or eddies. Velocities and current directions shown in the plates were obtained with floats submerged to a depth of 3 ft, therefore reflecting only the velocities in the top 3 ft of the flow. The small scale of the model made it difficult to measure water-surface elevations within an accuracy greater than ±0.1 ft prototype. Velocities and current directions were based on steady flows and would be somewhat different with varying flows, particularly when a hydrograph with rising and falling stages is considered. The model was of the fixed-bed type and was not designed to reproduce during the investigation of this study, any sediment movement that might occur in the prototype; therefore, changes in the channel configuration resulting from scour and deposition were not reflected in the model results herein. Any degradation of the Atchafalaya River channel or aggradation of Six Mile Lake resulting from the control structure could change the flow distributions obtained during the model tests. An evaluation of results of discharge measurements should consider that discharges were measured by means of calibrated model tailgates and the measurements could vary ±2.0 percent because of this method of measurement. Because the model included only a small section of the cutoff levee on Cypress Island, it was impossible to determine the effects of the levee on flow across the island below the modeled reach.

Summary of Results and Conclusions

20. The following indications and conclusions were developed during the investigation:

a. Without a structure in place, the velocities in the area of the proposed structure ranged from 1.5 fps to almost 6.0 fps for

the range of flows tested. For flows of 600,000-cfs basin discharge (576,000-cfs model discharge) or less, the maximum velocities in the area of the structure were about 4.0 fps.

b. The original design structure reduced the discharges diverted into Six Mile Lake from those obtained with no structure for basin discharges of 600,000 cfs and below. The diverted discharge was decreased from 42.2 to 28.1 percent, 44.0 to 32.6 percent, 41.7 to 33.2 percent, and 38.5 to 36.2 percent for basin discharges of 135,000, 300,000, 432,000, and 576,000 cfs, respectively. For discharges above 600,000 cfs the diverted discharge increased approximately 2.0 percent, because the cutoff levee prevented flow from crossing back across Cypress Island downstream of the structure.

c. With the el -5.0 notch for water-surface elevations that barely submerged or elevations that were below the crest of the levee on Cypress Island, the flow through the notch produced velocities as high as 11 fps 1,500 ft downstream of the axis of the structure.

d. Head losses through the original design structure were a maximum of 3.0 ft for the 300,000-cfs model discharge.

e. The Cypress Island cutoff levee caused ponding on the upstream end of the island.

f. The flow distribution in Six Mile Lake with the Plan A-1 structure was about the same or slightly lower than with the original design, except for the 135,000-cfs discharge where the distribution decreased from 28.1 percent to 20.2 percent for Plan A-1.

g. Velocities with Plan A-1 were less than those obtained with the original design, and the current patterns entering and leaving the notch were more uniform with the end contractions being less severe for all flows tested.

h. Head losses through the Plan A-1 structure were higher for the 135,000- and 300,000-cfs flows than with the original design, but were about the same for the other flows tested. The maximum head loss of 3.5 ft occurred with the 300,000-cfs discharge.

i. The percentage of discharge down Six Mile Lake for the Plan A-2 structure was 27.1, 31.6, 33.1, 36.2, 36.4, and 34.5 percent for the six flows tested.

j. Current patterns were the same with Plan A-2 as with Plan A-1; but because of the increase in diverted discharge into Six Mile Lake at discharges of 135,000, 300,000, and 432,000 cfs, the velocities 1,000 ft downstream of the axis of the structure were increased. Velocities for discharges of 576,000, 830,000, and 1,440,000 cfs were somewhat less than with Plan A-1.

k. Head losses through the Plan A-2 structure were 1 to 1.5 ft less than with Plan A-1 for the three lower discharges and were about the same for the higher discharges.

l. The original design structure produced approximately the desired flow distribution, but velocities downstream of the structure were higher and the end contractions at the notch were more severe than with Plans A-1 and A-2.

m. The Plan A-1 structure also produced approximately the desired flow distribution for most discharges tested, but for the 135,000-cfs discharge the diverted discharge was about 10 percent less than desired 30 percent.

n. Plan A-2 produced the best results of the three notch plans tested. The desired 70-30 percent flow distribution was obtained approximately, and the velocities were the lowest of the plans tested. However, Plan A-2 did produce some slight control of the discharge down Six Mile Lake for the 576,000-cfs discharge, which is higher than the basin discharge at which no control is desired.

o. Plan A-2 Modified produced the discharge distributions nearest the desired 70-30 percent flow distribution.

Table 1

Discharge and Flow Distribution

Plan	Discharge, cfs		Flow Distribution percent*
	Atchafalaya River	Six Mile Lake	
Miller's Point Discharge = 135,000 cfs			
Base Test	78,000	57,000	42.2
Original Design	97,100	37,900	28.1
Plan A-1	107,700	27,300	20.2
Plan A-2	98,400	36,600	27.1
Miller's Point Discharge = 300,000 cfs			
Base Test	168,000	132,000	44.0
Original Design	202,200	97,800	32.6
Plan A-1	209,100	90,900	30.3
Plan A-2	205,200	94,800	31.6
Miller's Point Discharge = 432,000 cfs			
Base Test	252,000	180,000	41.7
Original Design	288,500	143,500	33.2
Plan A-1	292,900	139,100	32.2
Plan A-2	289,000	143,000	33.1
Plan A-2 Modified	287,700	144,300	33.4
Miller's Point Discharge = 576,000 cfs			
Base Test	354,000	222,000	38.5
Original Design	367,800	208,200	36.2
Plan A-1	367,500	208,500	36.2
Plan A-2	367,500	208,500	36.2
Plan A-2 Modified	362,900	213,100	37.0
Miller's Point Discharge = 830,000 cfs			
Base Test	533,000	297,000	35.8
Original Design	522,400	307,600	37.1
Plan A-1	530,400	299,600	36.1
Plan A-2	527,900	302,100	36.4
Plan A-2 Modified	532,900	297,100	35.8
Miller's Point Discharge = 1,440,000 cfs			
Base Test	962,000	478,000	33.2
Original Design	935,200	504,800	35.1
Plan A-1	936,000	504,000	35.0
Plan A-2	943,200	496,800	34.5
Plan A-2 Modified	945,900	494,100	34.3

* Flow distribution obtained by dividing discharge at Six Mile Lake by discharge at Miller's Point.

Table 2

Water-Surface Profiles Miller's Point Discharge = 135,000 cfs

Gage* No.	Water-Surface Elevation, ft			
	Base Test	Original Design	Plan A-1	Plan A-2
1	3.9	4.2	4.1	4.1
2	3.7	4.0	4.0	4.0
3	3.7	3.9	4.0	3.9
4	3.5	3.8	3.9	3.8
5	3.4	3.8	3.8	3.8
6	3.4	3.8	3.8	3.7
7	3.3	3.7	3.7	3.7
8	3.2	3.6	3.6	3.6
9	3.1	3.6	3.5	3.5
10	3.0	3.5	3.5	3.5
11	2.9	3.4	3.5	3.5
12	3.6	4.0	4.0	3.9
13	3.5	3.9	4.0	3.8
14	3.4	3.7	4.0	3.7
15**	--	--	--	--
16	3.4	3.6	4.1	3.7
17	3.2	3.6	4.1	3.7
18U	3.2	3.6	4.1	3.5
18D	3.2	2.0	1.3	2.2
19	3.2	2.0	1.2	2.1
20	3.1	1.8	1.2	2.0
21†	3.0	1.8	1.2	1.9

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

† Verdunville Gage.

Table 3

Water Surface Profiles Miller's Point Discharge = 300,000 cfs

Gage* No.	Water-Surface Elevation, ft			
	Base Test	Original Design	Plan A-1	Plan A-2
1	8.3	9.7	9.3	9.1
2	8.1	9.6	9.3	9.0
3	7.9	9.5	9.2	8.9
4	7.7	9.3	9.0	8.6
5	7.3	9.2	8.9	8.5
6	7.6	9.1	8.9	8.4
7	7.3	9.0	8.8	8.3
8	6.9	8.7	8.3	7.8
9	6.8	8.6	8.3	7.8
10	6.5	8.4	8.0	7.6
11	6.5	8.4	8.0	7.6
12	7.9	9.6	9.2	8.8
13	7.7	9.5	9.1	8.7
14	7.6	9.4	9.1	8.6
15**	--	--	--	--
16	7.3	9.3	9.0	8.5
17	7.3	9.2	9.0	8.5
18U	7.1	8.8	8.7	8.0
18D	7.1	5.8	5.2	5.5
19	7.0	5.7	5.1	5.4
20	6.8	5.4	4.8	5.1
21†	6.7	5.1	4.6	4.7

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

† Verdunville Gage.

Table 4

Water-Surface Profiles Miller's Point Discharge = 432,000 cfs

Gage* No.	Water-Surface Elevation, ft				
	Base Test	Original Design	Plan A-1	Plan A-2	Plan A-2 Modified
1	11.2	11.9	11.3	11.7	11.9
2	11.1	11.7	11.0	11.5	11.6
3	10.8	11.5	10.8	11.3	11.4
4	10.3	11.1	10.2	10.8	11.0
5	10.3	11.1	10.2	10.8	11.0
6	10.2	10.9	10.0	10.6	10.5
7	9.9	10.7	9.9	10.4	10.5
8	9.4	10.2	8.9	9.8	10.1
9	9.3	9.9	8.9	9.5	9.9
10	8.8	9.3	8.2	9.0	9.5
11	8.8	9.3	8.0	9.0	9.4
12	10.6	11.4	10.9	11.3	11.4
13	10.4	11.4	10.8	11.0	11.2
14	10.3	11.3	10.8	11.0	11.1
15**	--	--	--	--	--
16	10.0	11.1	10.7	10.8	11.0
17	9.7	11.1	10.7	10.8	10.9
18U	9.6	10.6	10.3	10.3	10.3
18D	9.6	7.9	7.6	8.0	8.0
19	9.4	7.9	7.5	7.6	7.8
20	9.1	7.5	7.4	7.5	7.7
21†	8.8	7.3	7.1	7.3	7.4

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

† Verdunville Gage.

Table 5

Water-Surface Profiles Miller's Point Discharge = 576,000 cfs

Gage* No.	Water-Surface Elevation, ft				
	Base Test	Original Design	Plan A-1	Plan A-2	Plan A-2 Modified
1	13.5	13.8	14.1	14.0	14.0
2	13.3	13.5	13.6	13.7	13.7
3	12.8	13.2	13.3	13.3	13.4
4	12.4	12.6	12.6	12.8	12.7
5	12.4	12.6	12.5	12.6	12.7
6	12.3	12.5	12.4	12.5	12.6
7	12.0	12.2	12.0	12.3	12.3
8	11.3	11.5	11.3	11.5	11.7
9	11.1	11.2	11.1	11.3	11.4
10	10.4	10.4	10.1	10.3	10.5
11	10.4	10.3	10.0	10.1	10.5
12	12.8	13.1	13.2	13.4	13.3
13	12.4	13.0	13.0	13.2	13.1
14	12.3	12.8	12.9	13.0	13.0
15**	--	--	--	--	--
16	11.9	12.5	12.8	12.7	12.8
17	11.7	12.5	12.7	12.7	12.7
18U	11.4	12.1	12.2	12.2	12.3
18D	11.4	10.6	10.6	10.8	10.9
19	11.3	10.5	10.6	10.6	10.7
20	10.9	10.3	10.4	10.6	10.7
21†	10.8	10.3	10.3	10.5	10.5

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

† Verdunville Gage.

Table 6

Water-Surface Profiles Miller's Point Discharge = 830,000 cfs

Gage* No.	Water-Surface Elevation, ft				
	Base Test	Original Design	Plan A-1	Plan A-2	Plan A-2 Modified
1	17.3	17.4	17.9	17.6	17.4
2	17.0	17.1	17.3	17.3	17.0
3	16.4	16.7	16.9	16.9	16.6
4	16.0	16.0	16.1	15.9	15.8
5	16.0	15.7	16.0	15.8	15.7
6	15.7	15.7	15.8	15.8	15.5
7	15.2	15.5	15.3	15.3	15.2
8	14.7	14.8	14.6	14.7	14.6
9	14.4	14.6	14.4	14.5	14.3
10	13.7	13.5	13.4	13.1	13.2
11	13.0	12.9	12.8	12.6	12.7
12	16.2	16.5	16.6	16.7	16.4
13	15.9	16.1	16.5	16.3	16.1
14	15.8	16.1	16.2	16.2	16.1
15**	--	--	--	--	--
16	15.2	15.6	16.2	15.9	15.8
17	15.1	15.5	16.1	15.9	15.7
18U	15.0	15.3	15.8	15.5	15.4
18D	15.0	15.0	15.2	15.0	14.8
19	14.5	14.8	15.0	14.8	14.6
20	14.3	14.6	14.8	14.7	14.5
21†	14.1	14.5	14.6	14.5	14.2

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

† Verdunville Gage.

Table 7

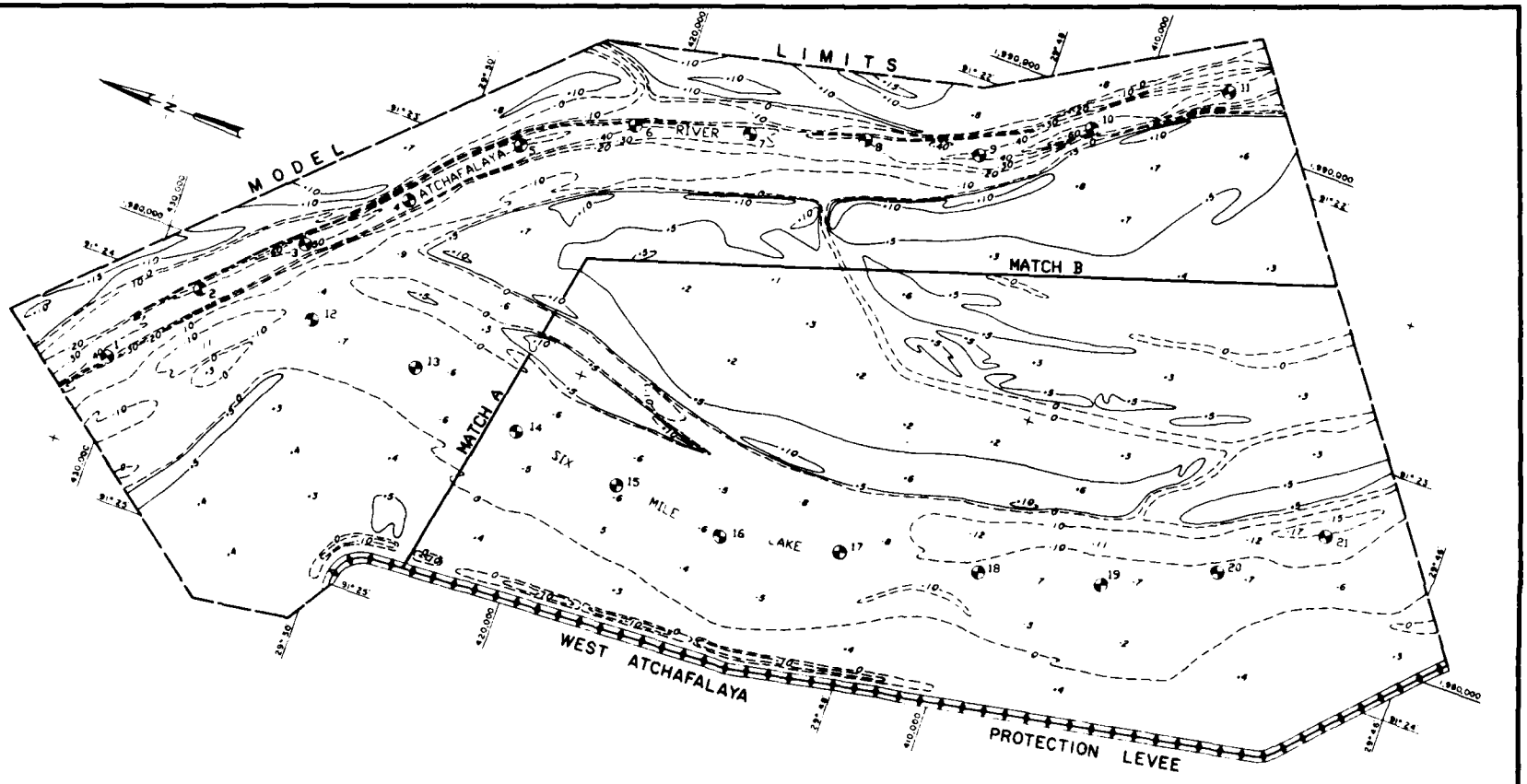
Water-Surface Profiles Miller's Point Discharge = 1,440,000 cfs

Gage* No.	Water-Surface Elevation, ft				
	Base Test	Original Design	Plan A-1	Plan A-2	Plan A-2 Modified
1	24.0	25.3	25.9	25.6	25.9
2	23.5	24.7	25.2	25.0	25.2
3	23.0	24.5	24.5	24.5	24.7
4	22.4	23.7	23.6	23.4	23.5
5	22.1	23.7	23.5	23.4	23.4
6	22.1	23.5	23.3	23.3	23.4
7	22.0	23.2	22.8	22.9	23.0
8	21.6	22.8	22.1	22.2	22.5
9	21.5	22.6	22.0	22.1	22.3
10	20.6	21.9	20.8	20.8	20.8
11	19.6	21.1	20.1	19.7	19.8
12	23.0	24.3	24.3	24.2	24.2
13	22.7	23.9	23.8	23.7	23.7
14	22.5	23.7	23.8	23.5	23.7
15**	--	--	--	--	--
16	21.9	23.3	23.4	23.1	23.4
17	21.9	23.2	23.4	23.0	23.3
18U	21.7	23.1	23.2	22.8	23.1
18D	21.7	23.0	22.8	22.4	22.8
19	21.5	22.8	22.6	22.3	22.5
20	21.2	22.7	22.4	22.1	22.3
21†	21.0	22.6	22.2	21.8	22.0

* Gages 1 through 11 are in the Atchafalaya River and Gages 12 to 21 are in Six Mile Lake beginning at the head of Cypress Island. Gage 18U is 200 ft upstream and 18D is 500 ft downstream of the axis of the control structure and on the center line of the weir notch.

** Gage 15 is inoperable.

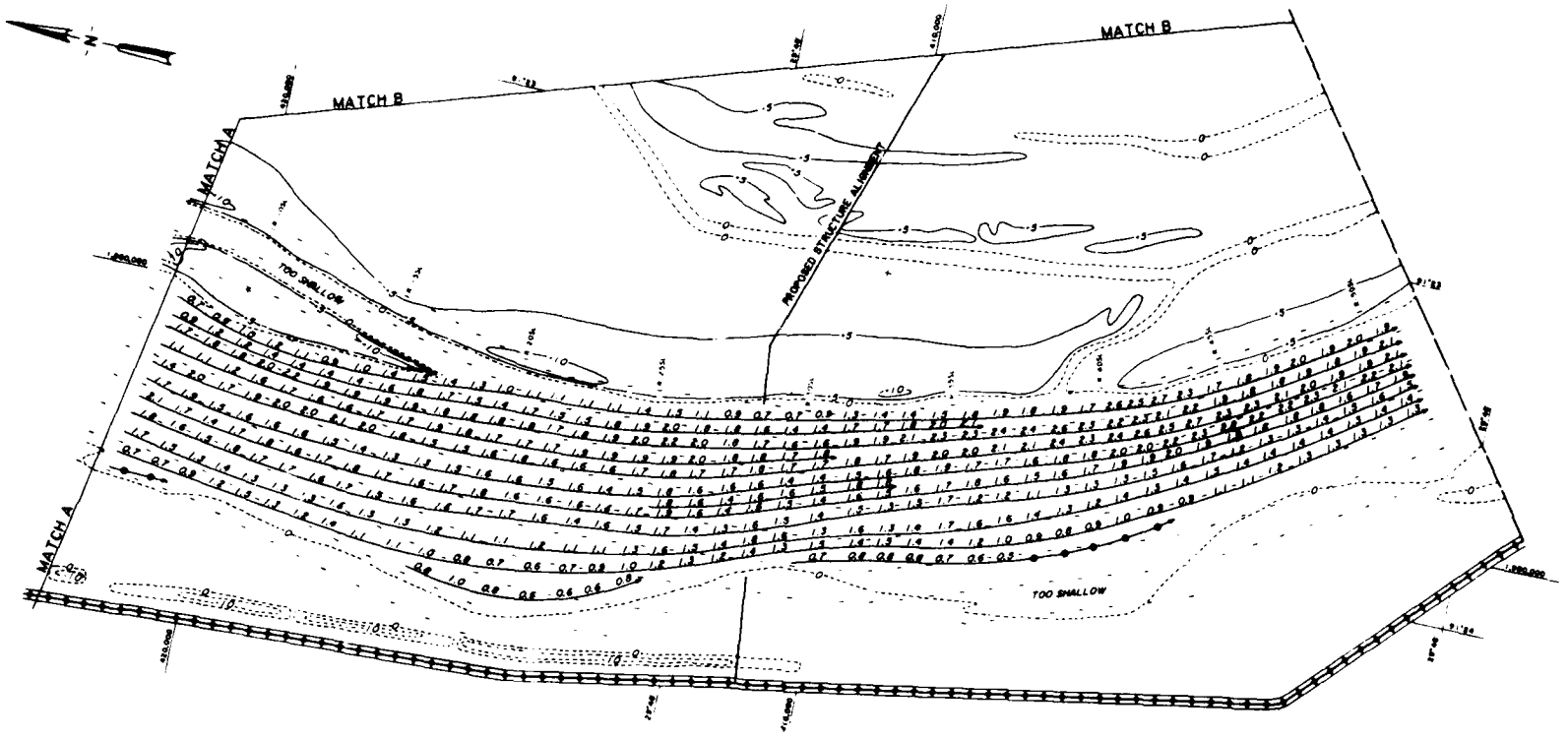
† Verdunville Gage.



PROTOTYPE SURVEY - 1976

PLATE 1

PLATE 2



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

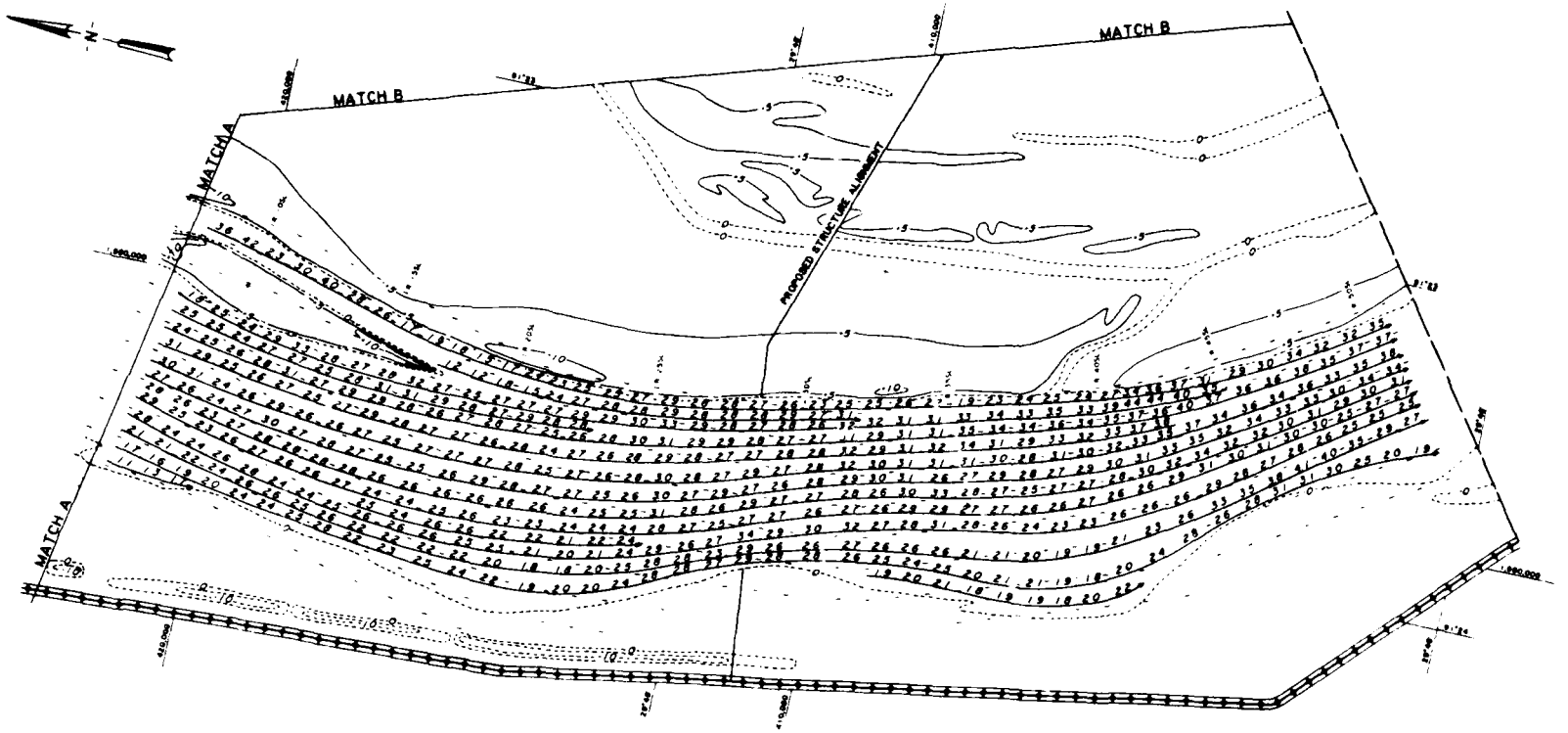
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

BASE TEST

MILLER'S POINT DISCHARGE	135,000 CFS
SIX MILE LAKE DISCHARGE	57,000 CFS
VERDUNVILLE STAGE, EL	3.0 FT



LEGEND

FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

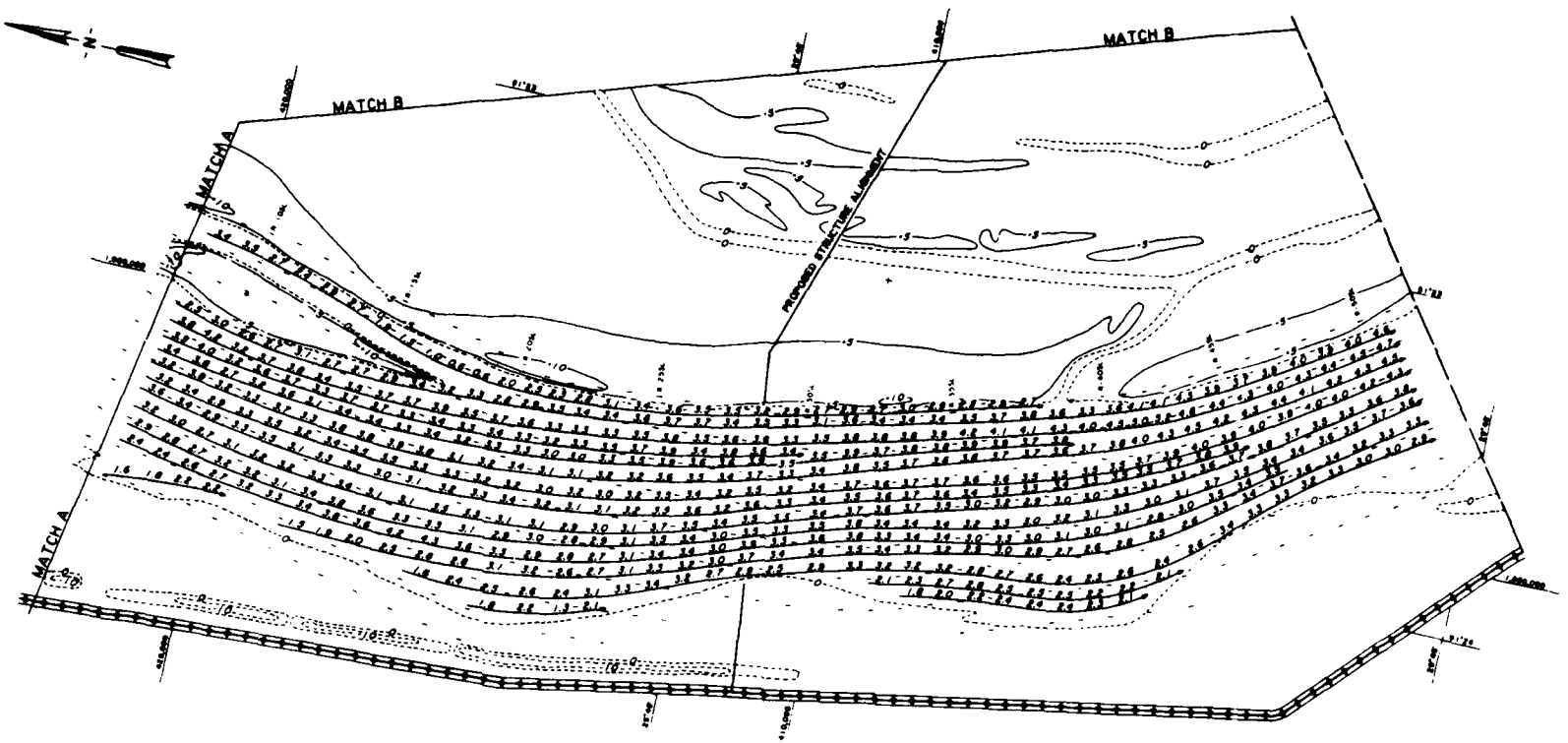
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

BASE TEST

MILLER'S POINT DISCHARGE	300,000 CFS
SIX MILE LAKE DISCHARGE	132,000 CFS
VERDUNVILLE STAGE, EL	6.7 FT

PLATE 3

PLATE 4



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

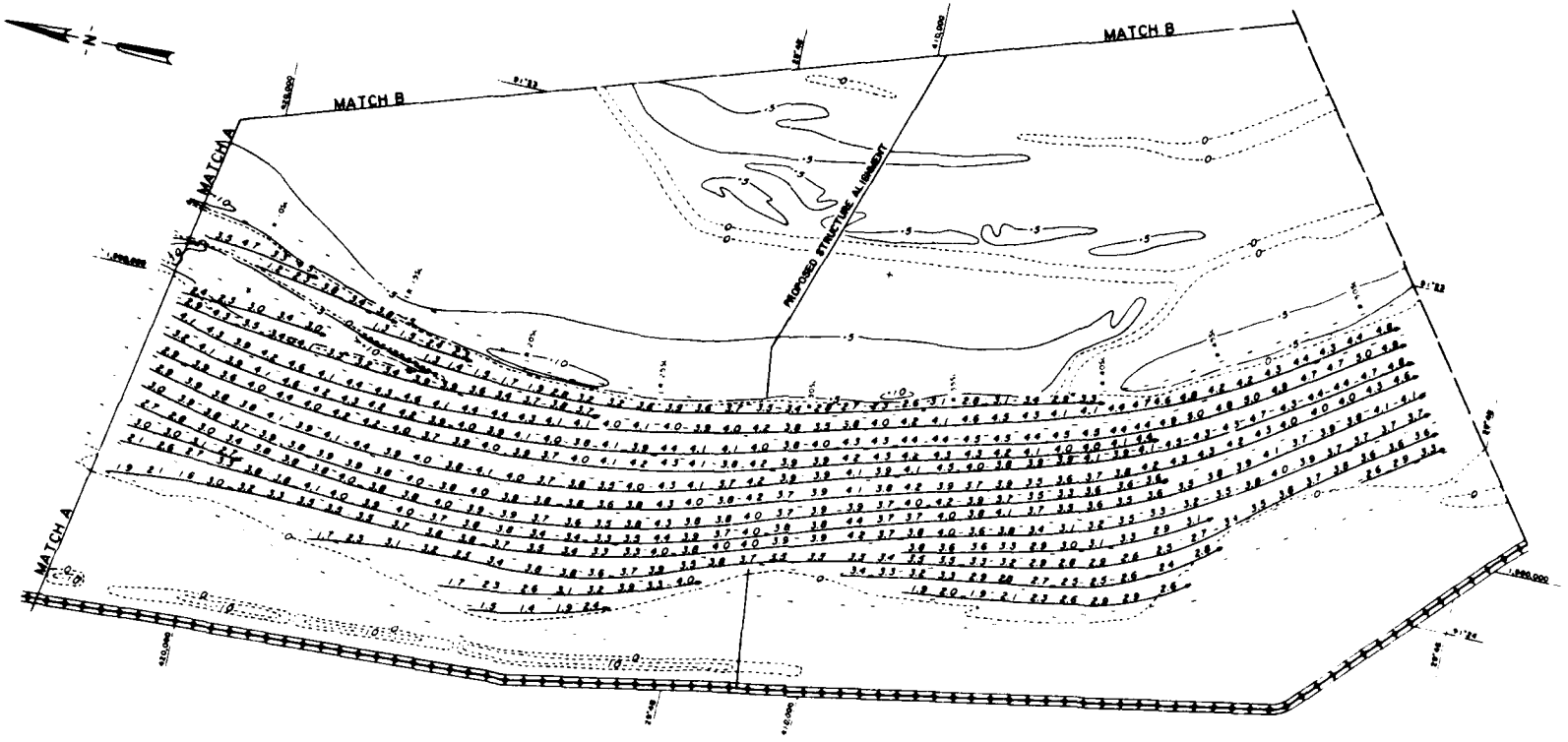
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

BASE TEST

MILLER'S POINT DISCHARGE	432,000 CFS
SIX MILE LAKE DISCHARGE	180,000 CFS
VERDUNVILLE STAGE, EL	88 FT



LEGEND

- 3.7 — FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE 1000 0 1000 2000 3000

MODEL 10 0 10 20 30

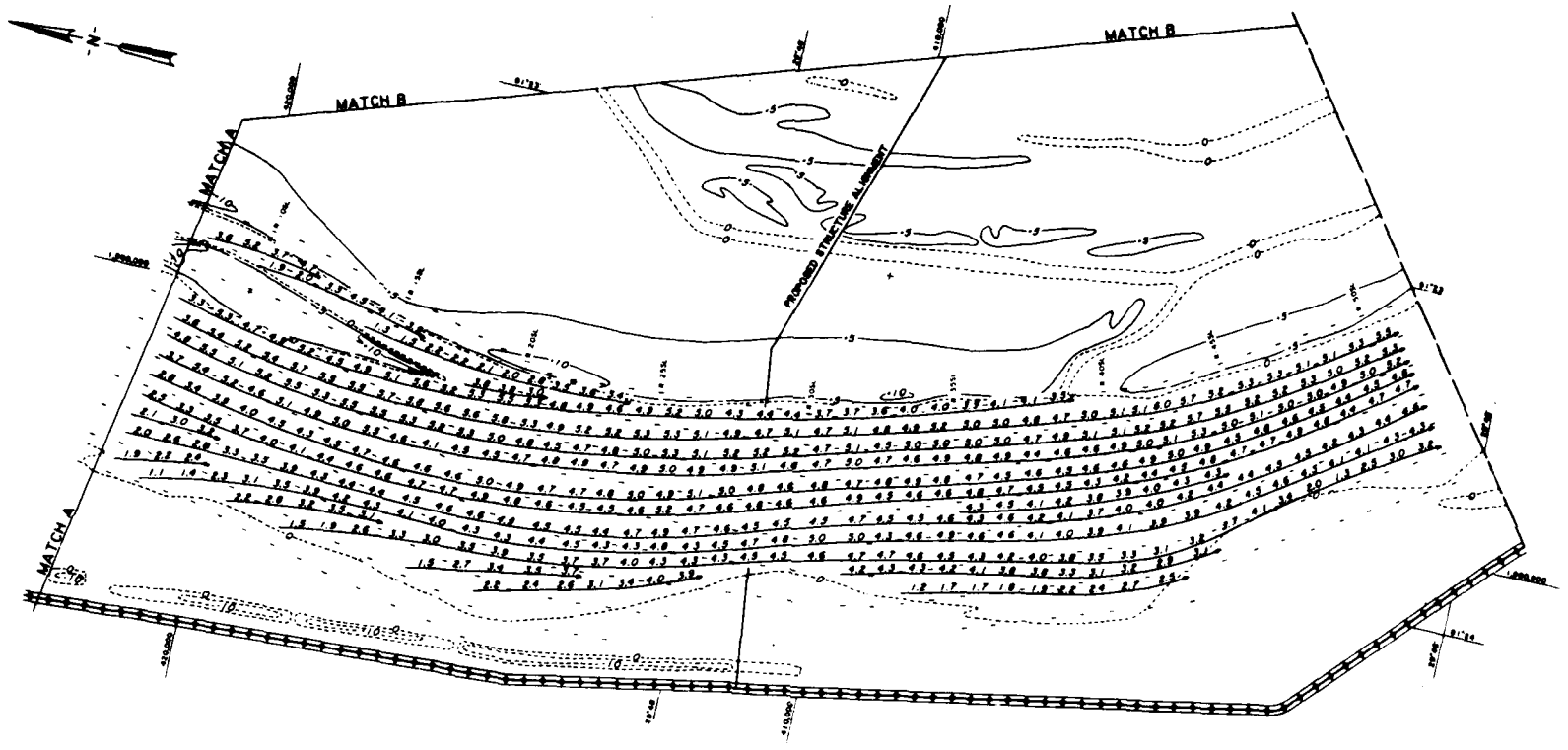
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

BASE TEST

MILLER'S POINT DISCHARGE	576,000 CFS
SIX MILE LAKE DISCHARGE	222,000 CFS
VERDUNVILLE STAGE, EL	10.8 FT

PLATE 5

PLATE 6



LEGEND

- .67 — FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- —•— FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

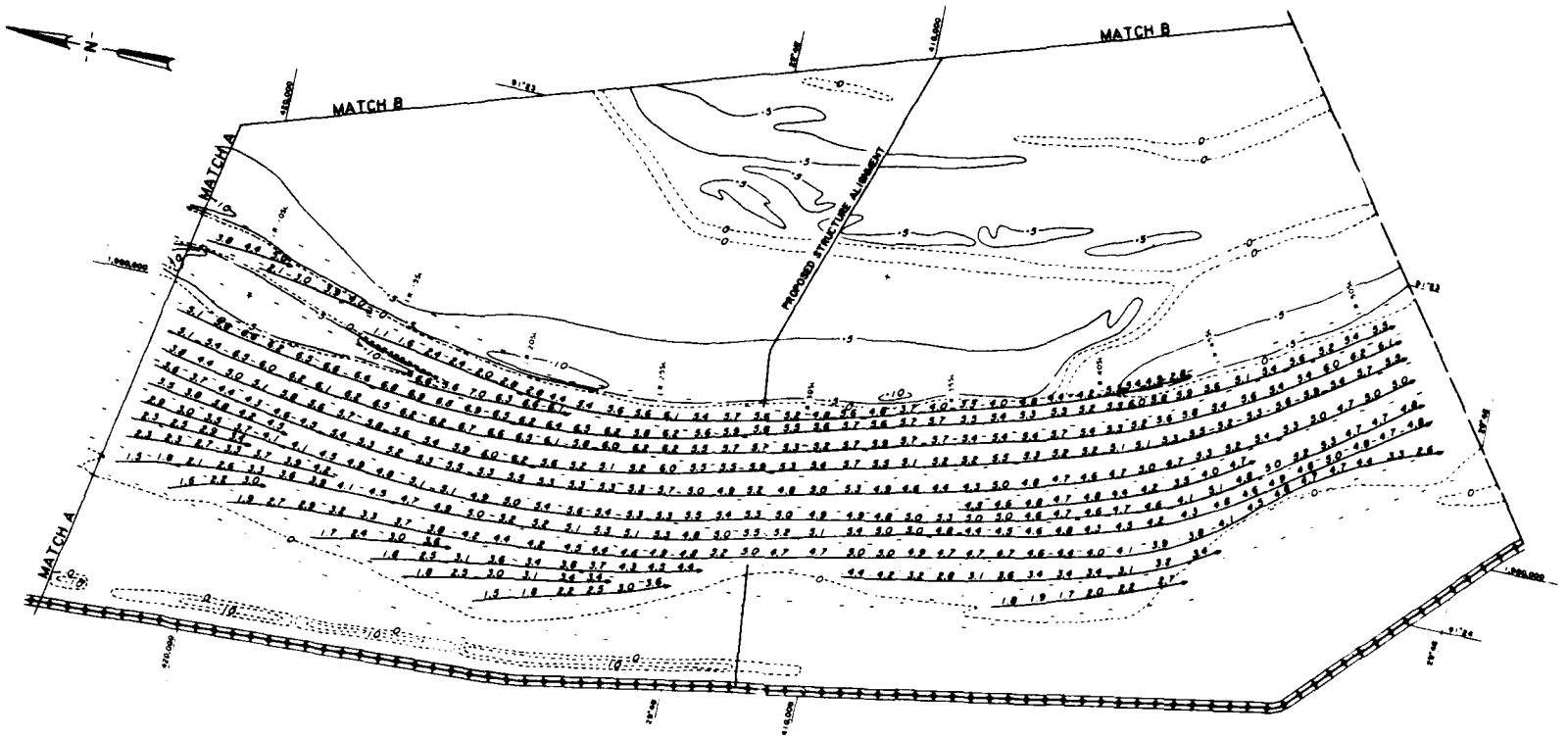
PROTOTYPE 1000 0 1000 2000 3000

MODEL 0 5 10 15 20

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

BASE TEST

MILLER'S POINT DISCHARGE	830,000 CFS
SIX MILE LAKE DISCHARGE	297,000 CFS
VERDUNVILLE STAGE, EL	14.1 FT



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

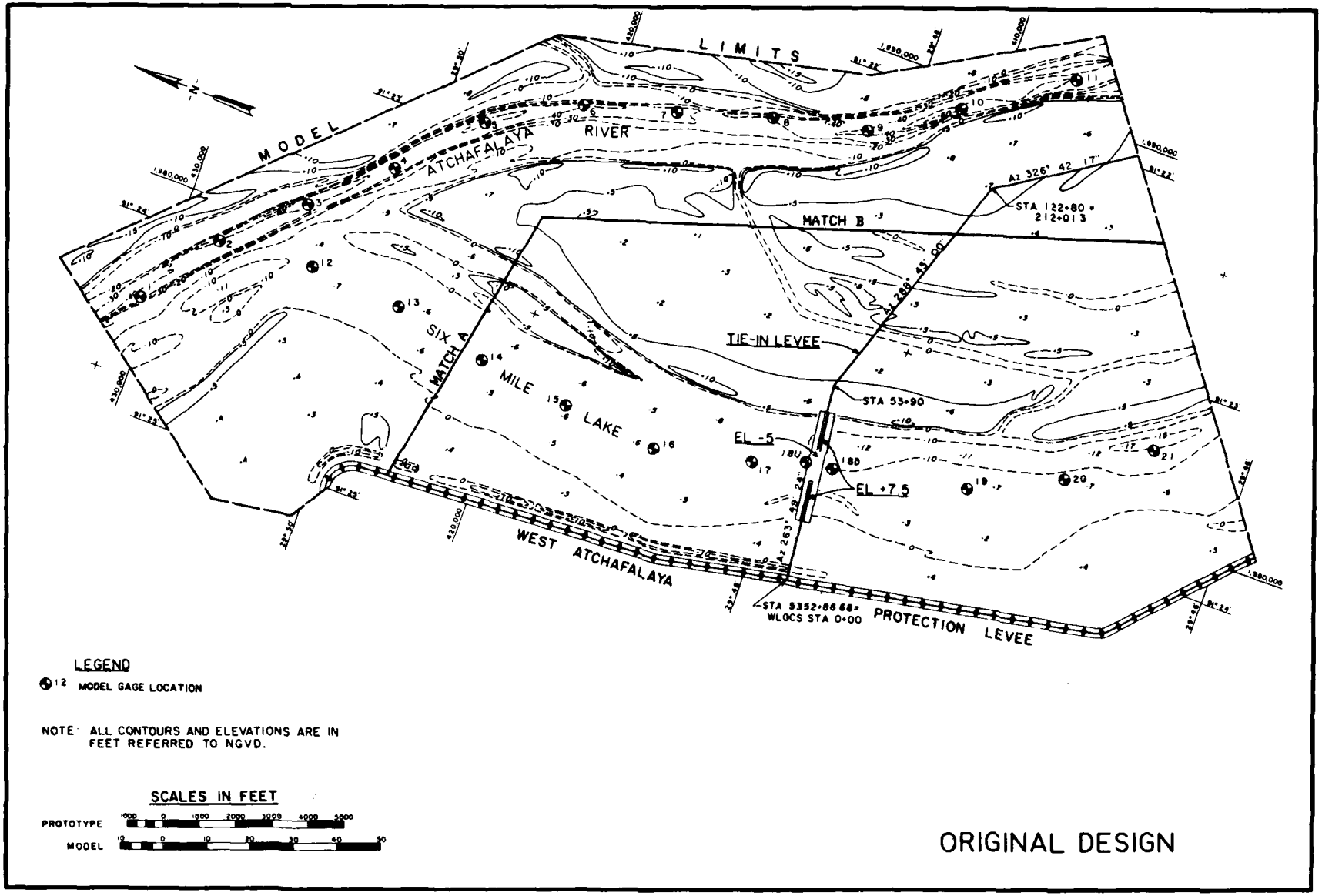
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

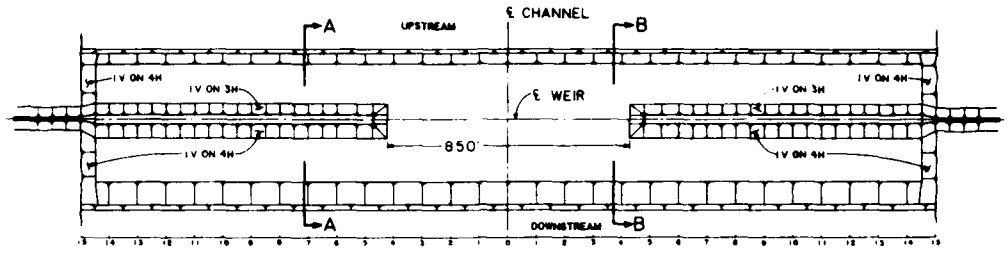
BASE TEST

MILLER'S POINT DISCHARGE 1,440,000 CFS
SIX MILE LAKE DISCHARGE 478,000 CFS
VERDUNVILLE STAGE, EL 21.0 FT

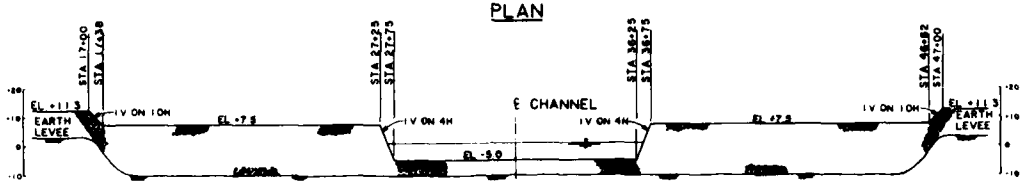
PLATE 7

PLATE 8

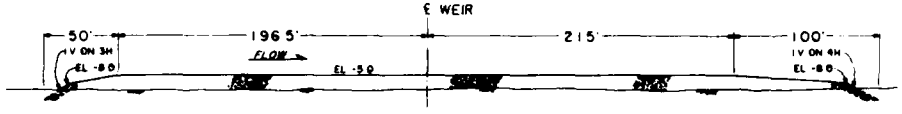

MODEL LIMITS
ATCHAFALAYA RIVER
MATCH B
STA 122+80 = 212+013
Az 326° 42' 17"
Az 238° 45' 00"
TIE-IN LEVEE
STA 53+90
SIX MILE LAKE
MATCH A
EL -5
EL +7.5
Az 263° 24' 39"
WEST ATCHAFALAYA
STA 5352+86.68 = WLOCS STA 0+00
PROTECTION LEVEE
LEGEND
12 MODEL GAGE LOCATION
NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD.
SCALES IN FEET
PROTOTYPE
MODEL
ORIGINAL DESIGN



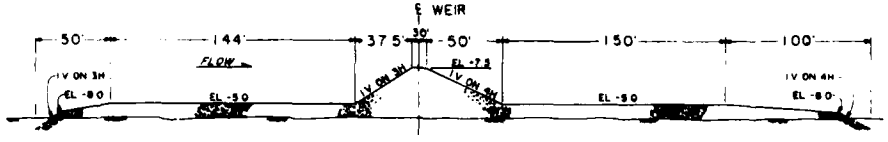
PLAN



℄ PROFILE

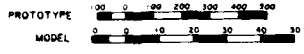


SECTION B-B
NOT TO SCALE



SECTION A-A
NOT TO SCALE

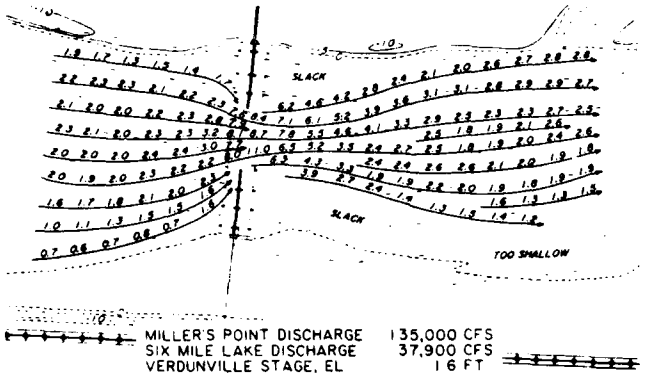
SCALES IN FEET



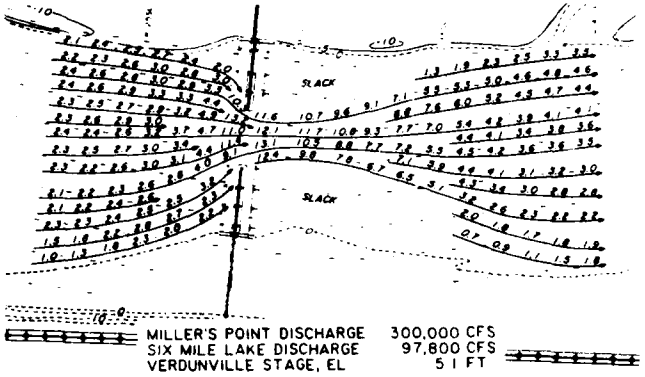
ORIGINAL WEIR DESIGN

PLATE 9

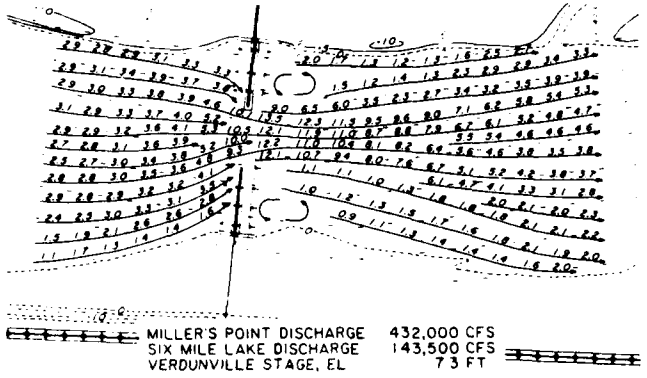
PLATE 10



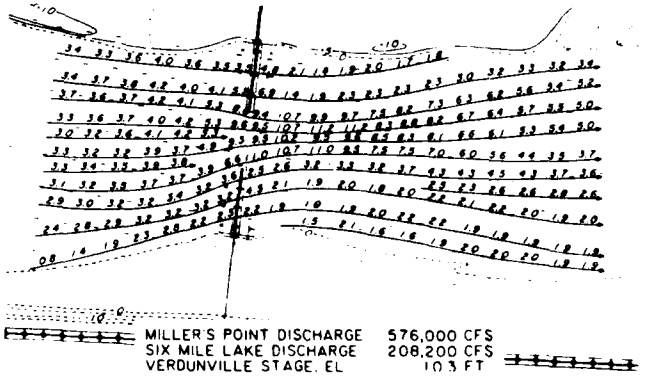
MILLER'S POINT DISCHARGE 135,000 CFS
SIX MILE LAKE DISCHARGE 37,900 CFS
VERDUNVILLE STAGE, EL 1 6 FT



MILLER'S POINT DISCHARGE 300,000 CFS
SIX MILE LAKE DISCHARGE 97,800 CFS
VERDUNVILLE STAGE, EL 5 1 FT



MILLER'S POINT DISCHARGE 432,000 CFS
SIX MILE LAKE DISCHARGE 143,500 CFS
VERDUNVILLE STAGE, EL 7 3 FT



MILLER'S POINT DISCHARGE 576,000 CFS
SIX MILE LAKE DISCHARGE 208,200 CFS
VERDUNVILLE STAGE, EL 10 3 FT

LEGEND

.52 FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

SCALES IN FEET

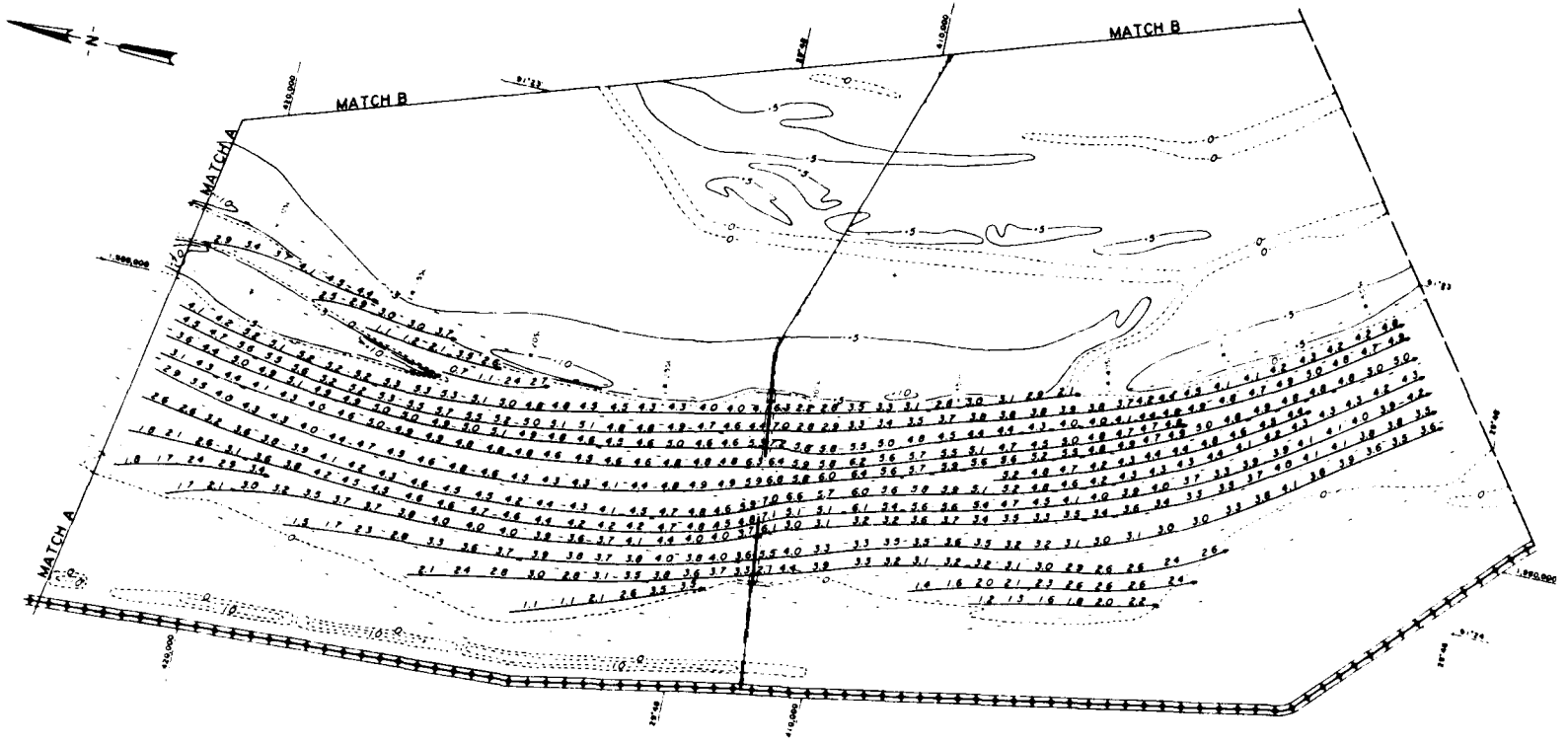
PROTOTYPE 0 1000 2000 3000

MODEL 0 1 2 3

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

ORIGINAL DESIGN - AVERAGE TAILWATER



LEGEND

- 5.7 — FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE 1000 0 1000 2000 3000

MODEL 0 0 0 40 80

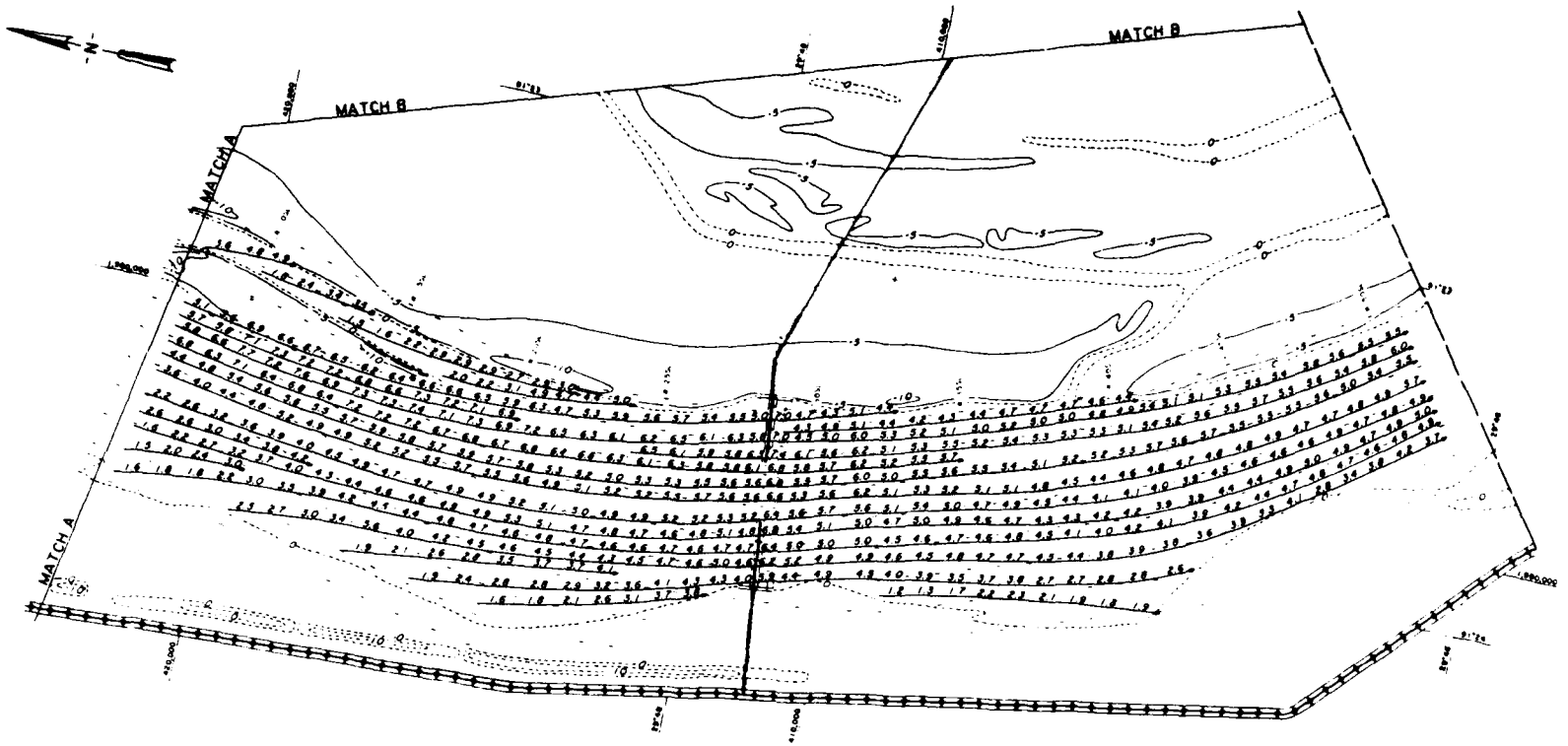
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

ORIGINAL DESIGN

MILLER'S POINT DISCHARGE	830,000 CFS
SIX MILE LAKE DISCHARGE	307,600 CFS
VERDUNVILLE STAGE, EL	145 FT

PLATE 11

PLATE 12



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

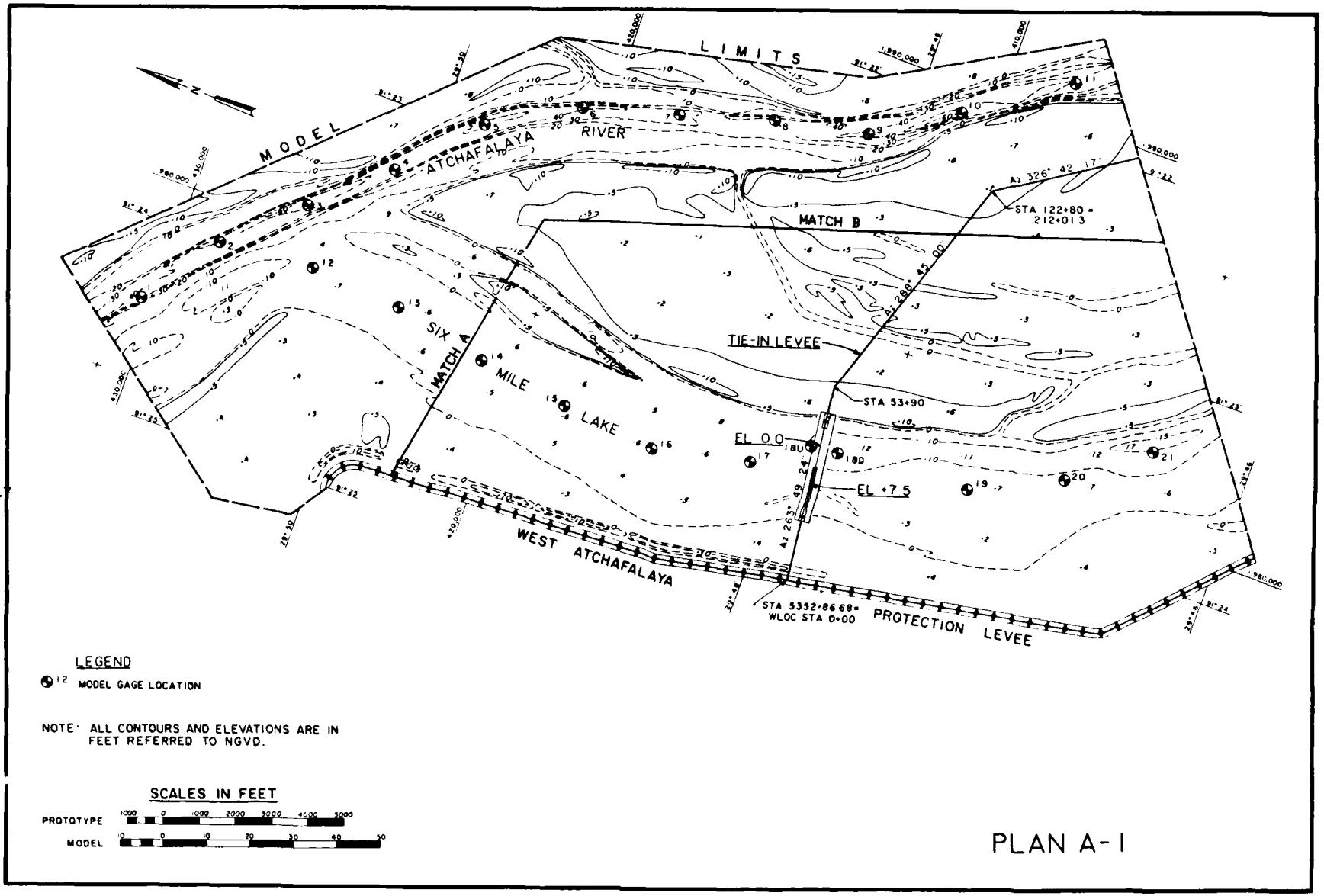
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

ORIGINAL DESIGN

MILLER'S POINT DISCHARGE	1,440,000 CFS
SIX MILE LAKE DISCHARGE	504,800 CFS
VERDUNVILLE STAGE, EL	22 6 FT



LEGEND

12 MODEL GAGE LOCATION

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD.

SCALES IN FEET

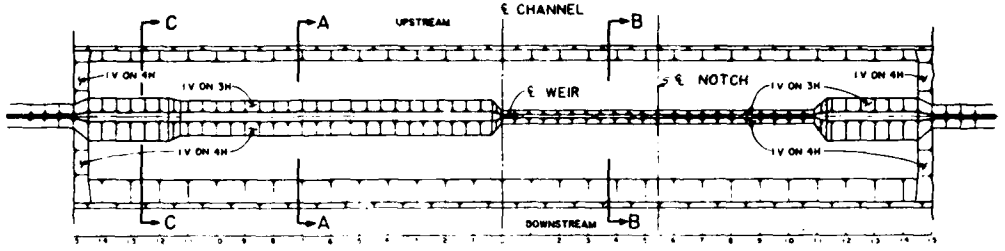
PROTOTYPE 1000 0 1000 2000 3000 4000 5000

MODEL 0 0 10 20 30 40 50

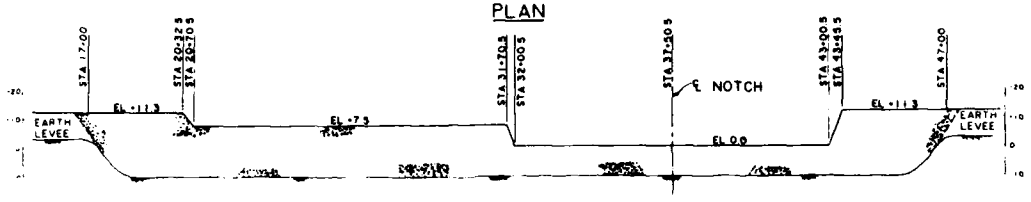
PLATE 13

PLAN A-1

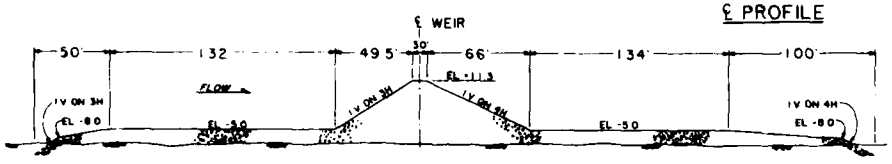
PLATE 14



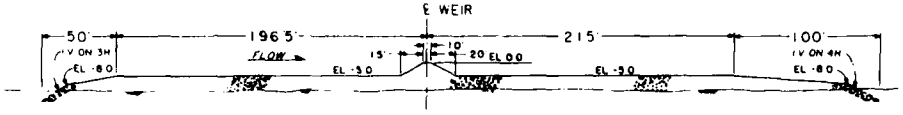
PLAN



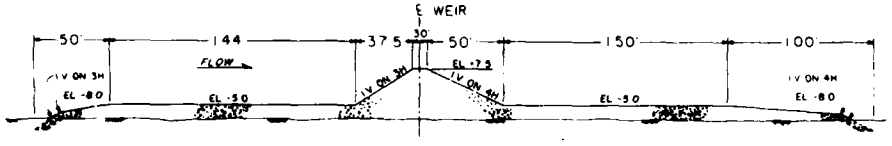
℄ PROFILE



SECTION C-C
NOT TO SCALE

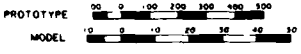


SECTION B-B
NOT TO SCALE

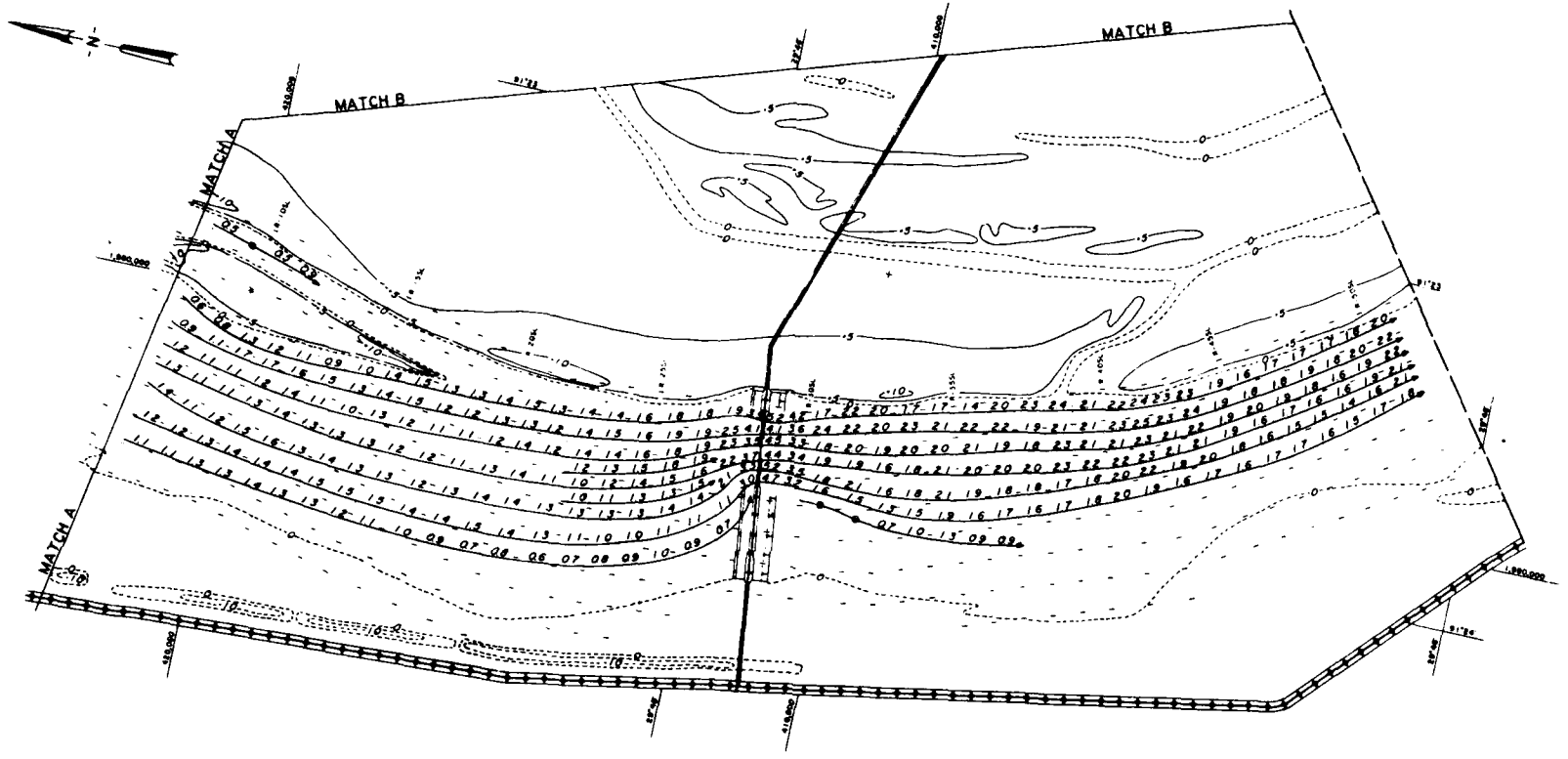


SECTION A-A
NOT TO SCALE

SCALES IN FEET



PLAN A-1 WEIR DESIGN



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

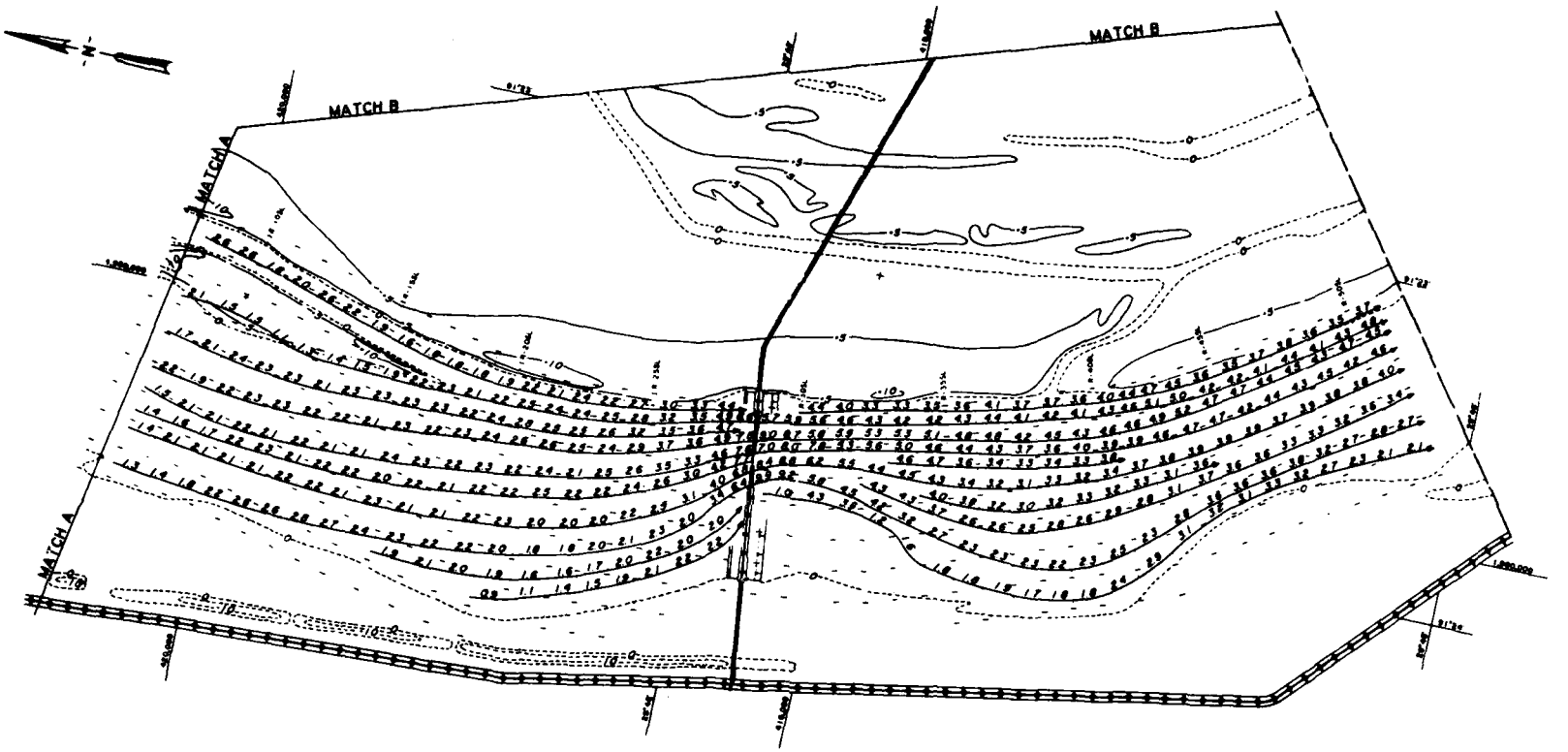
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

MILLER'S POINT DISCHARGE	135,000 CFS
SIX MILE LAKE DISCHARGE	27,300 CFS
VERDUNVILLE STAGE, EL	12 FT

PLATE 15

PLATE 16



LEGEND

-.5- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

-•- FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

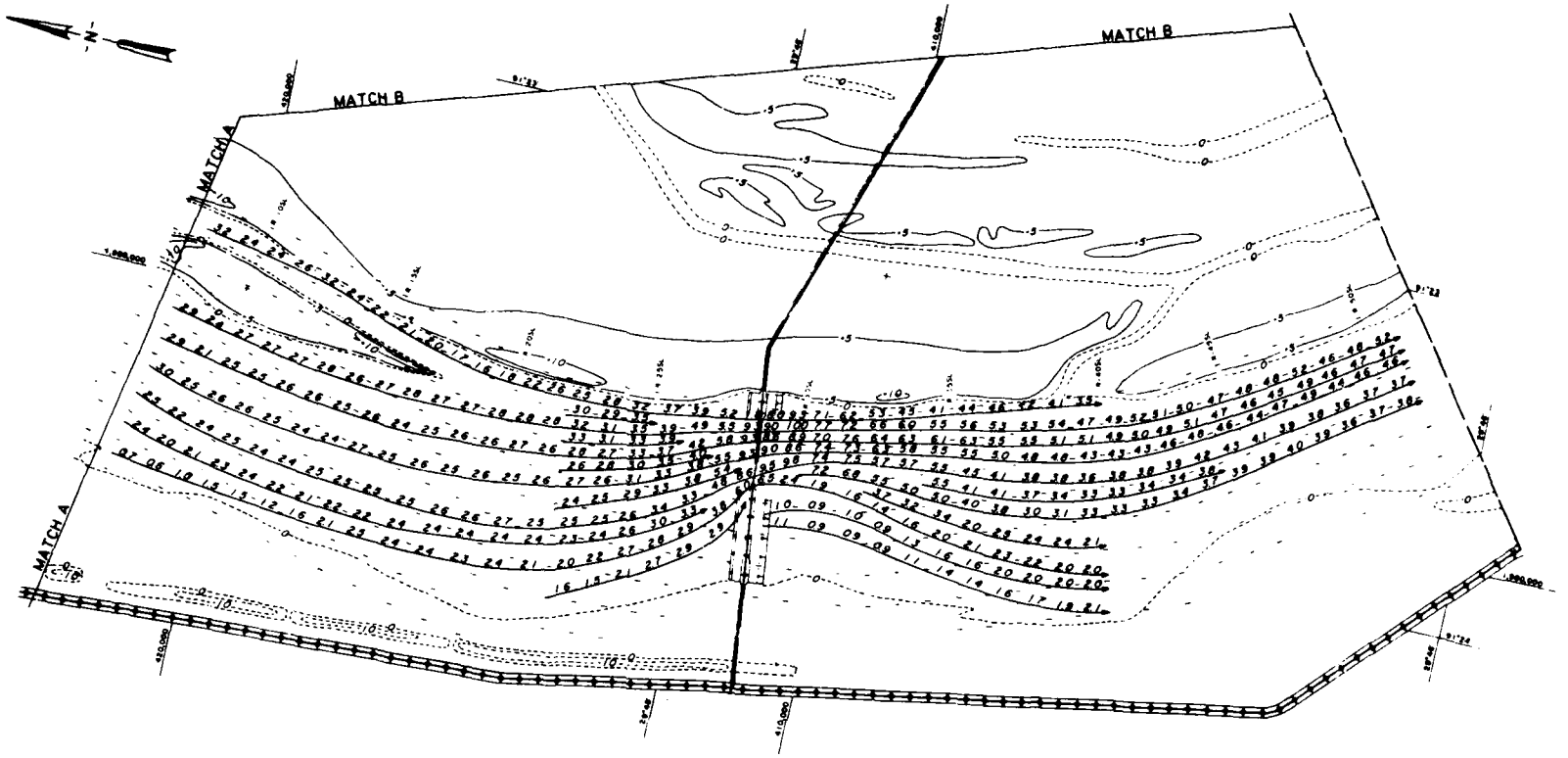
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

MILLER'S POINT DISCHARGE	300,000 CFS
SIX MILE LAKE DISCHARGE	90,900 CFS
VERDUNVILLE STAGE, EL	4 6 FT



LEGEND

FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

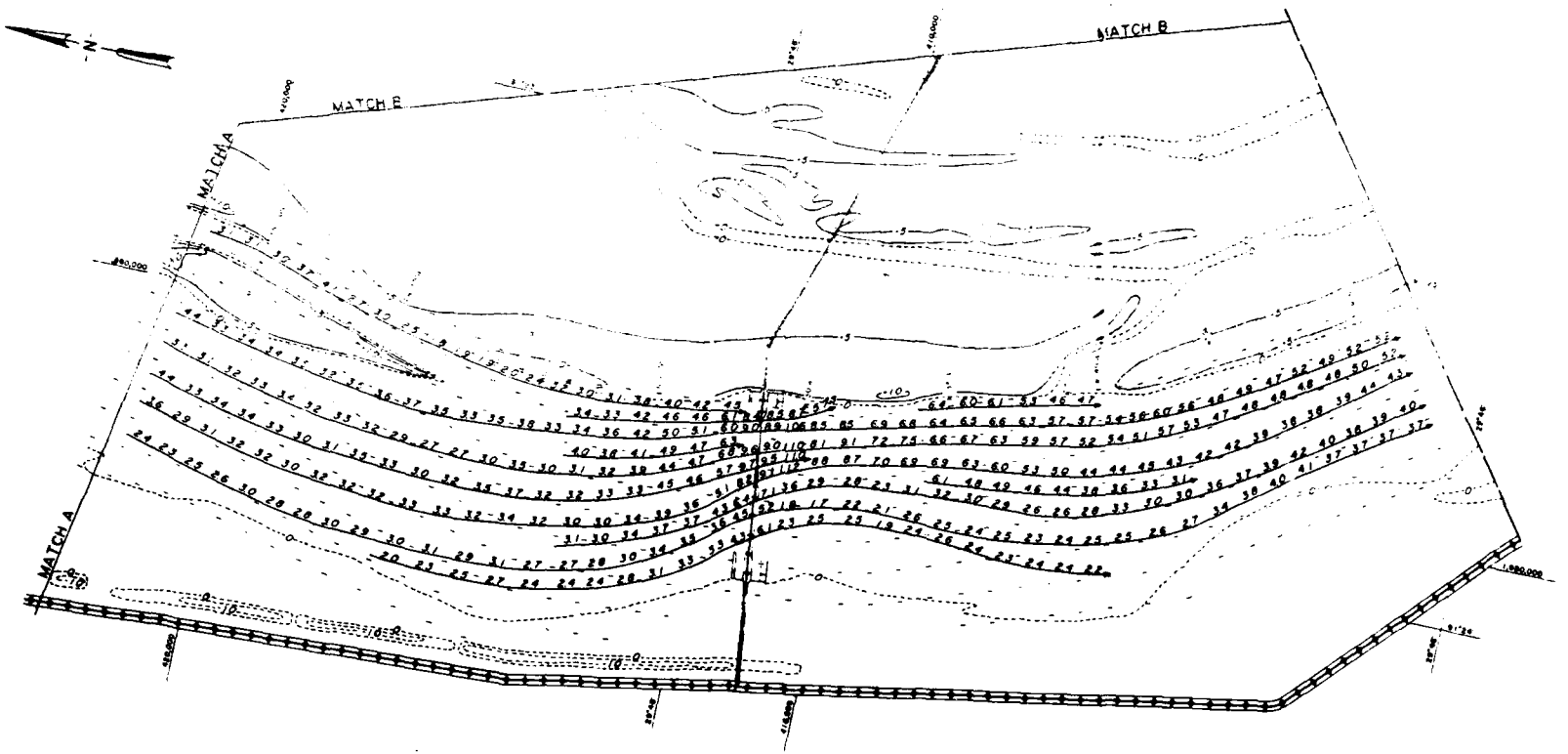
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

MILLER'S POINT DISCHARGE	432,000 CFS
SIX MILE LAKE DISCHARGE	139,100 CFS
VERDUNVILLE STAGE, EL	7 1 FT

PLATE 17

PLATE 18



LEGEND

- 27 — FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- —●— FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

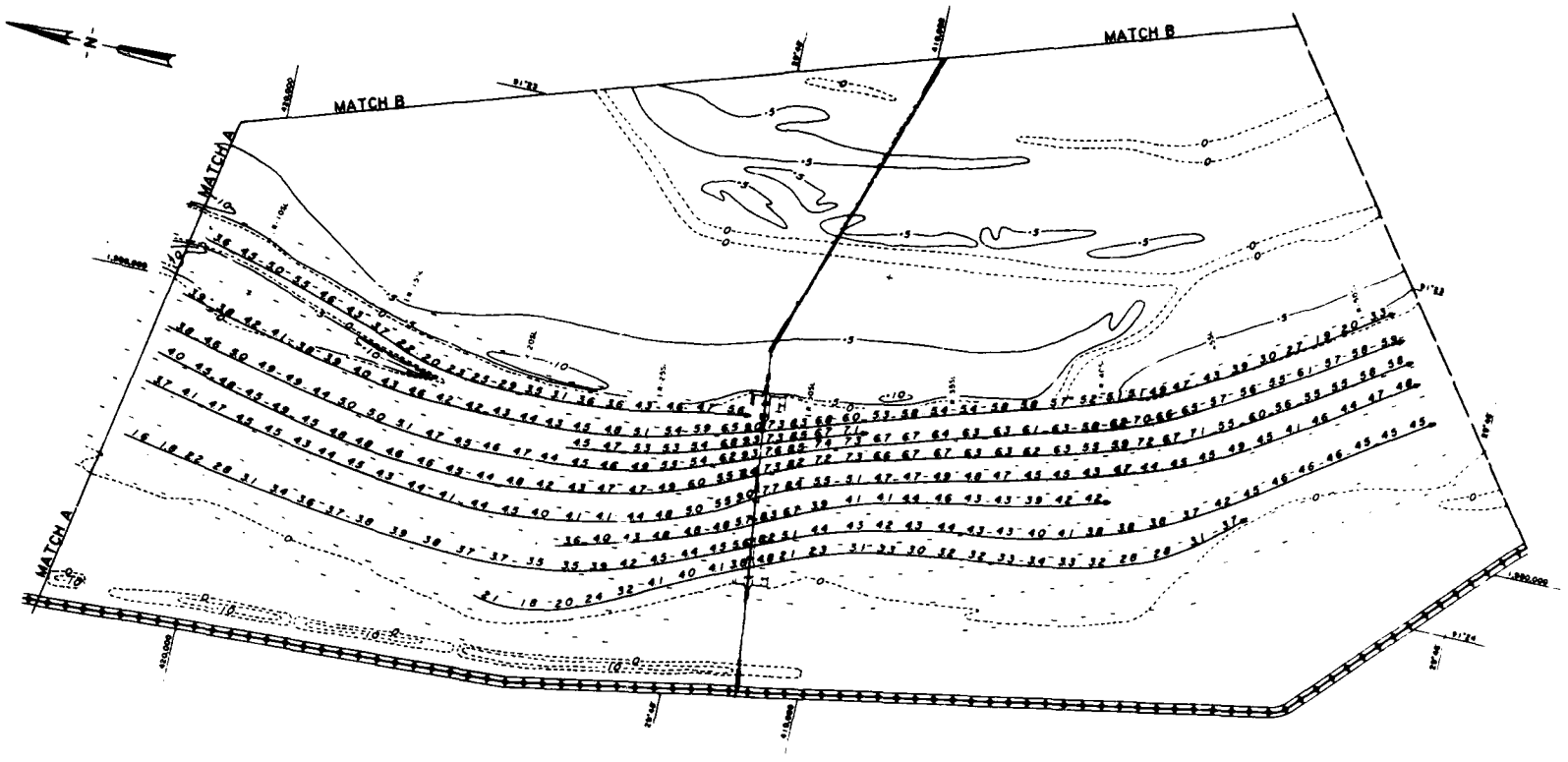
PROTOTYPE 1000 0 1000 2000 3000

MODEL 10 0 10 20 30

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

MILLER'S POINT DISCHARGE	576,000 CFS
SIX MILE LAKE DISCHARGE	208,500 CFS
VERDUNVILLE STAGE, EL	10.3 FT



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

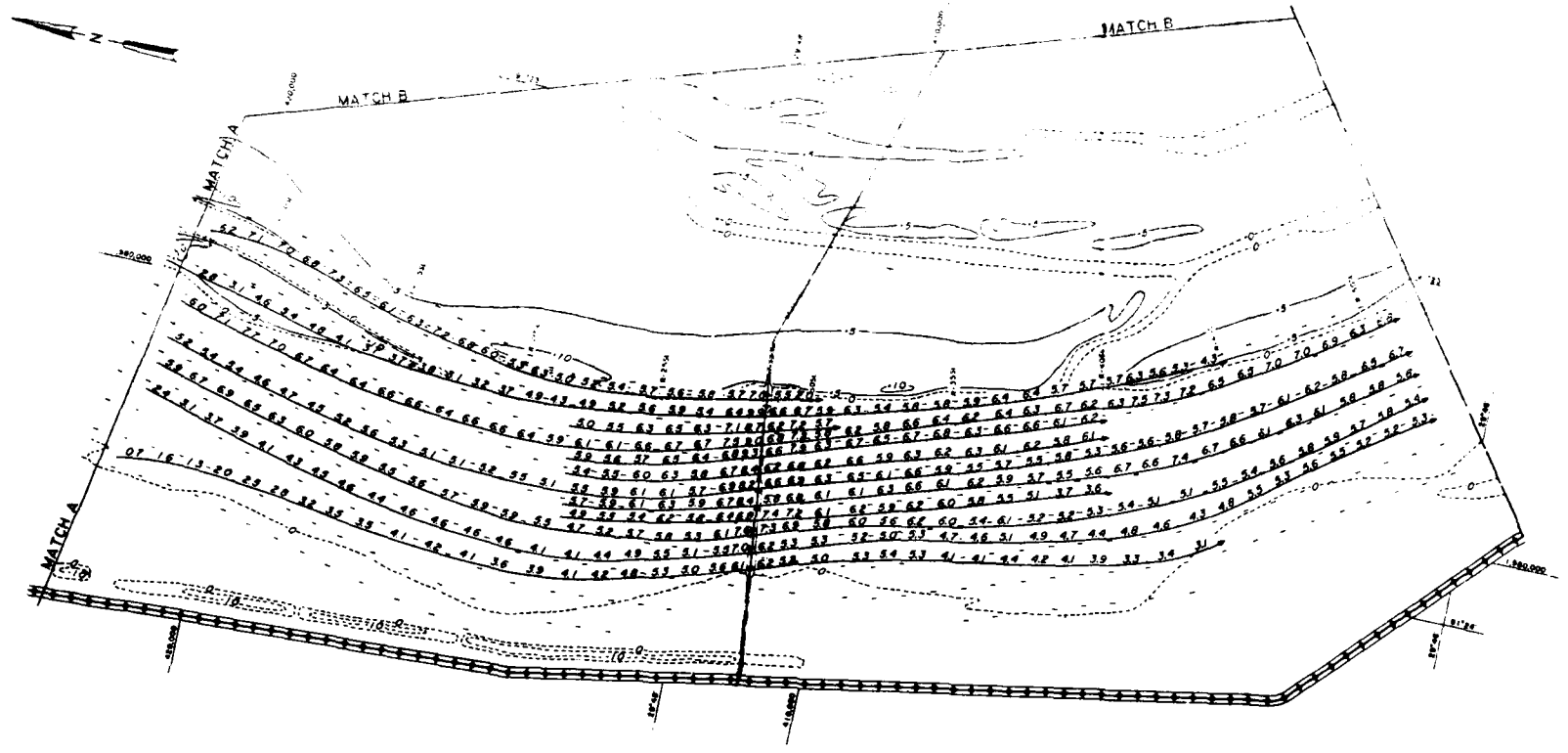
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

MILLER'S POINT DISCHARGE	830,000 CFS
SIX MILE LAKE DISCHARGE	299,600 CFS
VERDUNVILLE STAGE, EL	14.6 FT

PLATE 19

PLATE 20



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

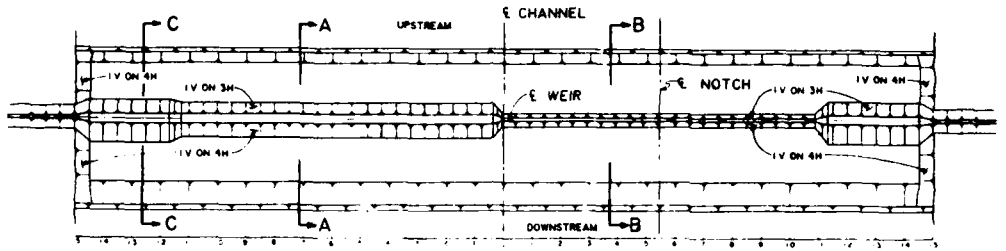
PROTOTYPE

MODEL

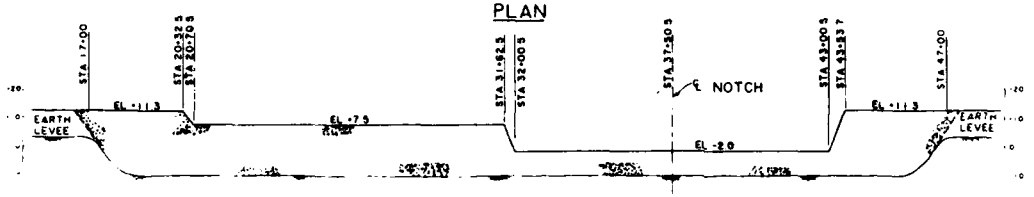
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-1

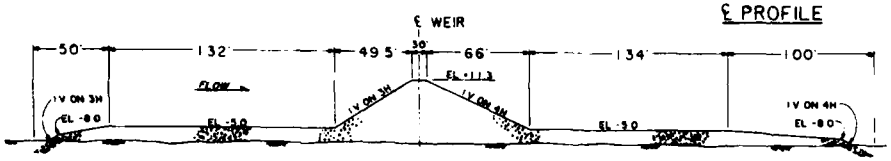
MILLER'S POINT DISCHARGE	1,440,000 CFS
SIX MILE LAKE DISCHARGE	504,000 CFS
VERDUNVILLE STAGE, EL	22.2 FT



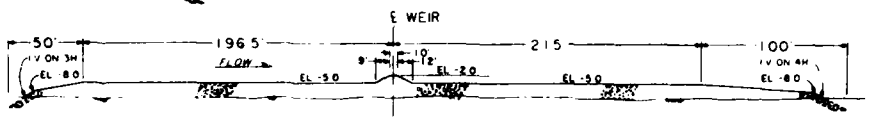
PLAN



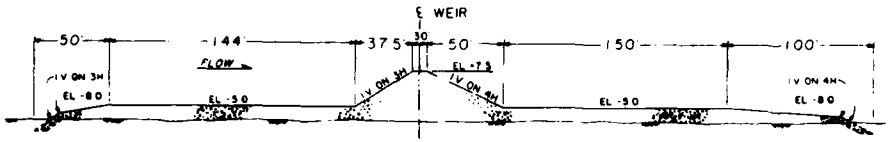
℄ PROFILE



SECTION C-C
NOT TO SCALE



SECTION B-B
NOT TO SCALE



SECTION A-A
NOT TO SCALE

SCALES IN FEET

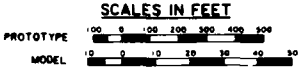
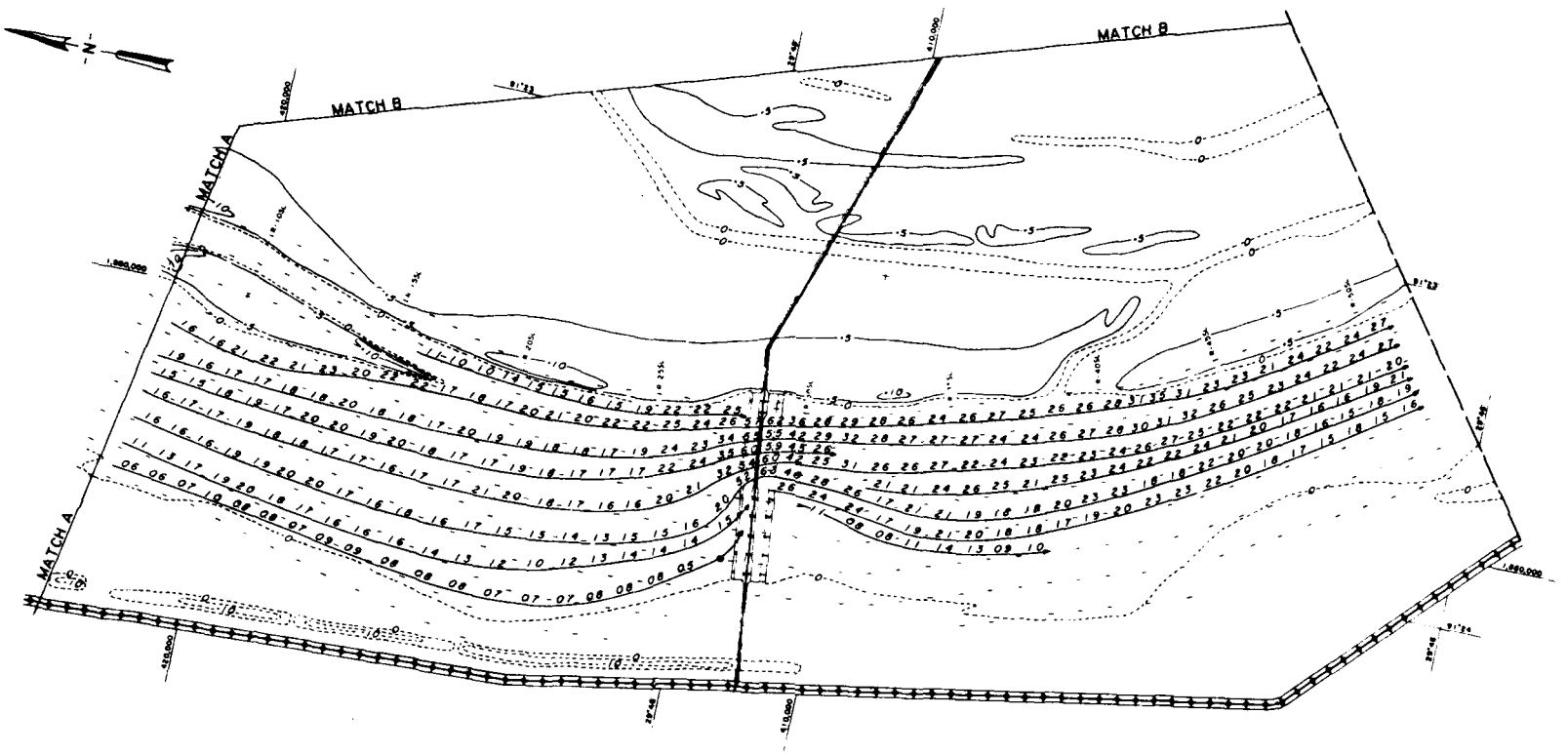


PLATE 21

PLAN A-2 WEIR DESIGN

PLATE 22



LEGEND

FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

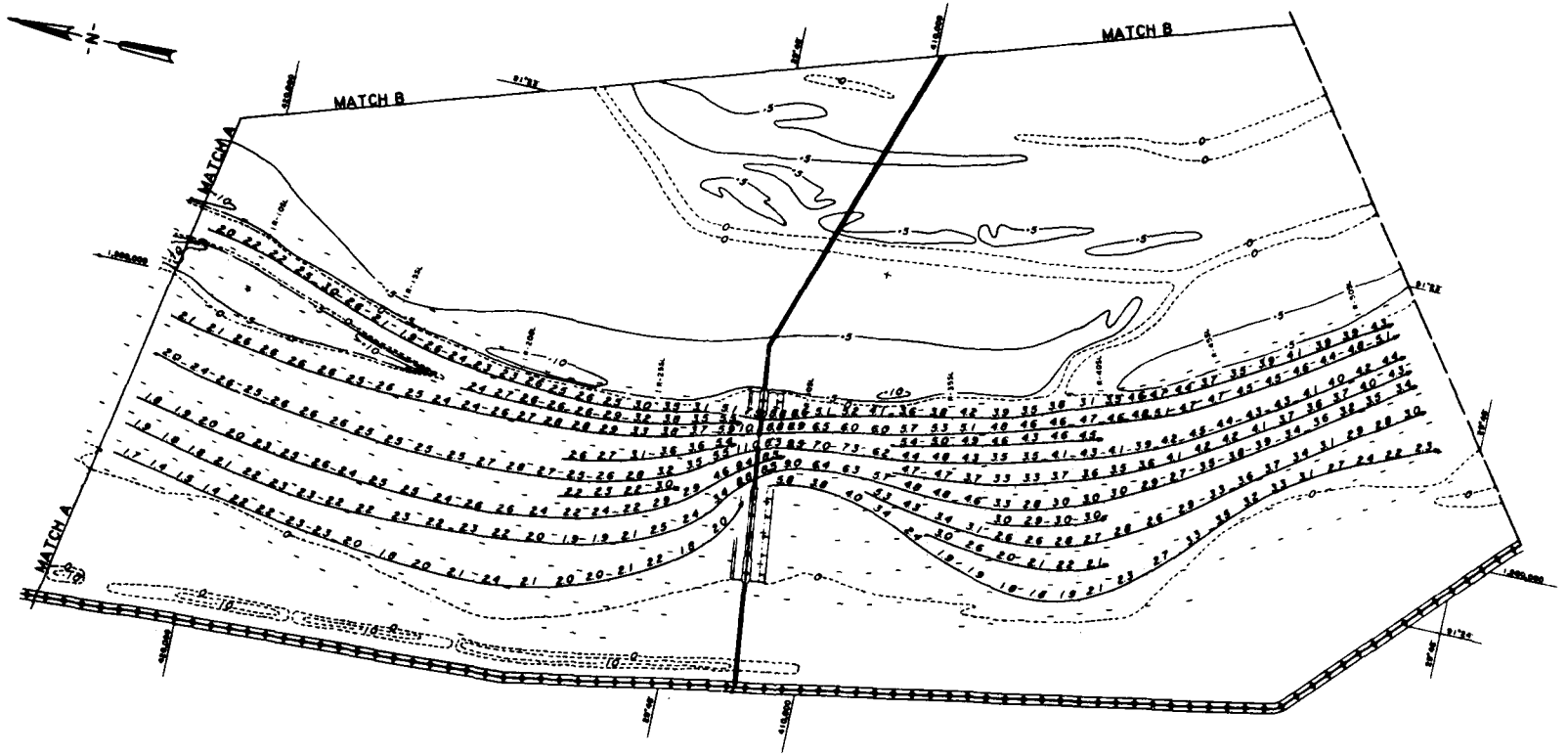
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE	135,000 CFS
SIX MILE LAKE DISCHARGE	36,600 CFS
VERDUNVILLE STAGE, EL	1 9 FT



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

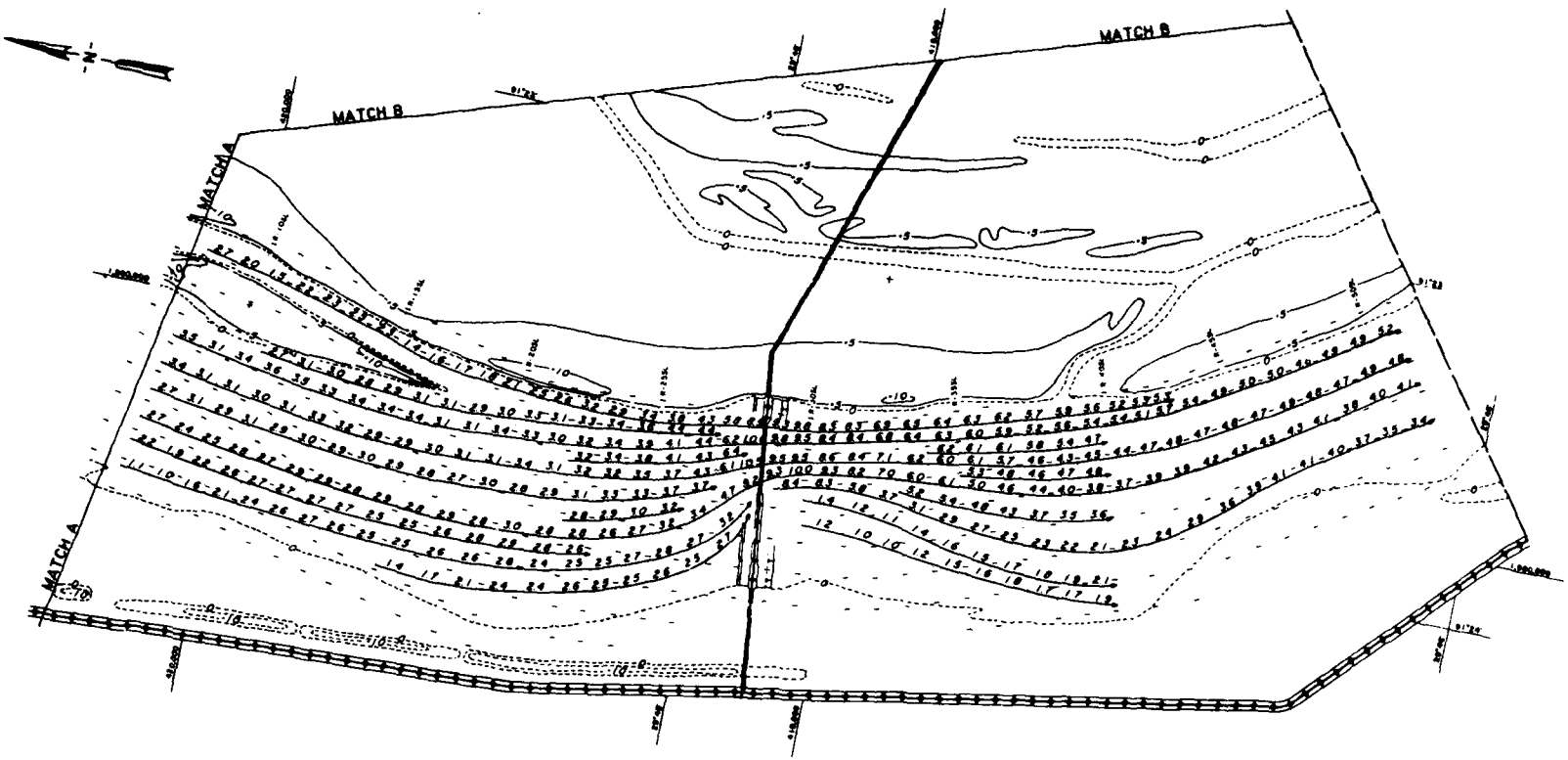
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE	300,000 CFS
SIX MILE LAKE DISCHARGE	94,800 CFS
VERDUNVILLE STAGE, EL	4.7 FT

PLATE 23

PLATE 24



LEGEND

FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

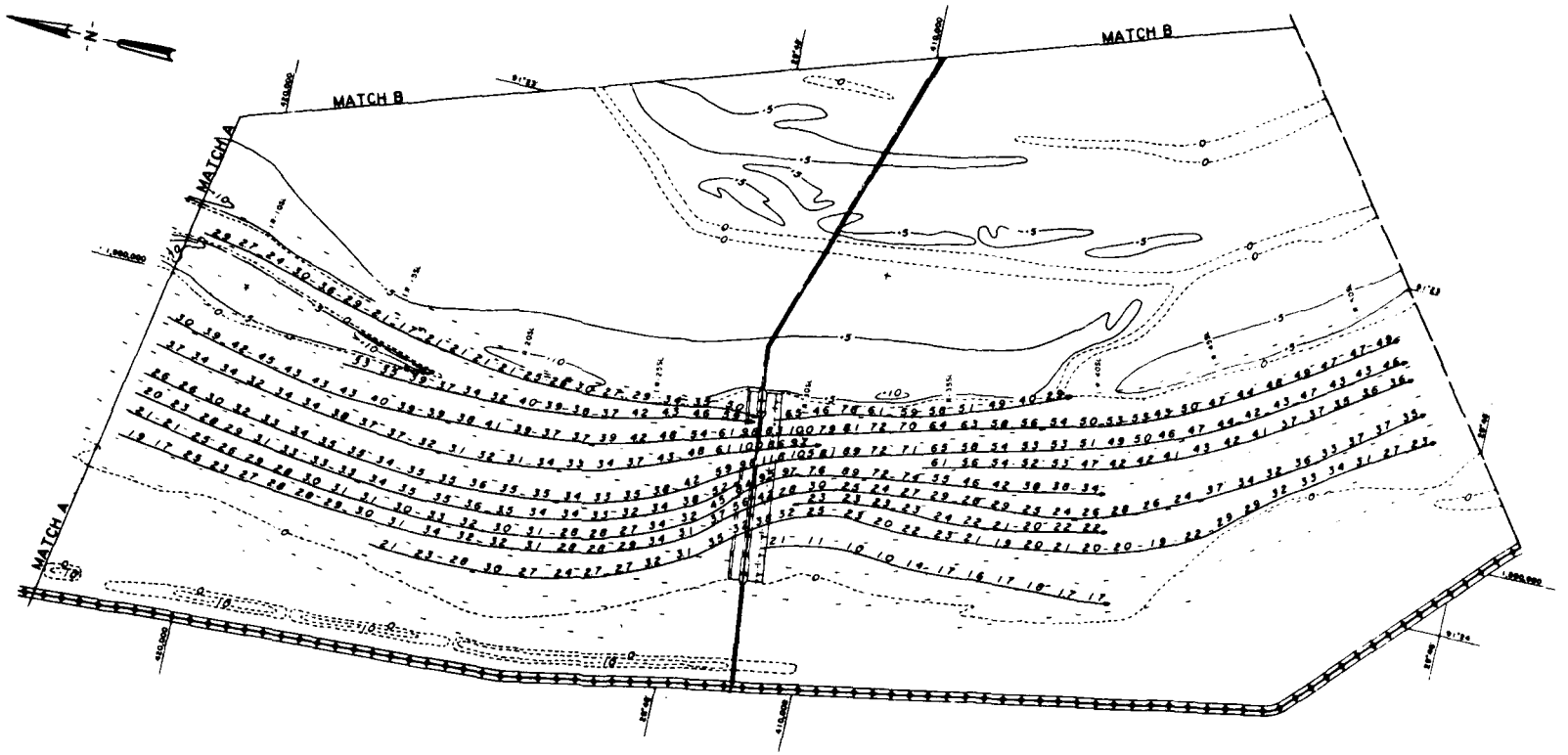
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE	432,000 CFS
SIX MILE LAKE DISCHARGE	143,000 CFS
VERDUNVILLE STAGE, EL	7 3 FT



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE: ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

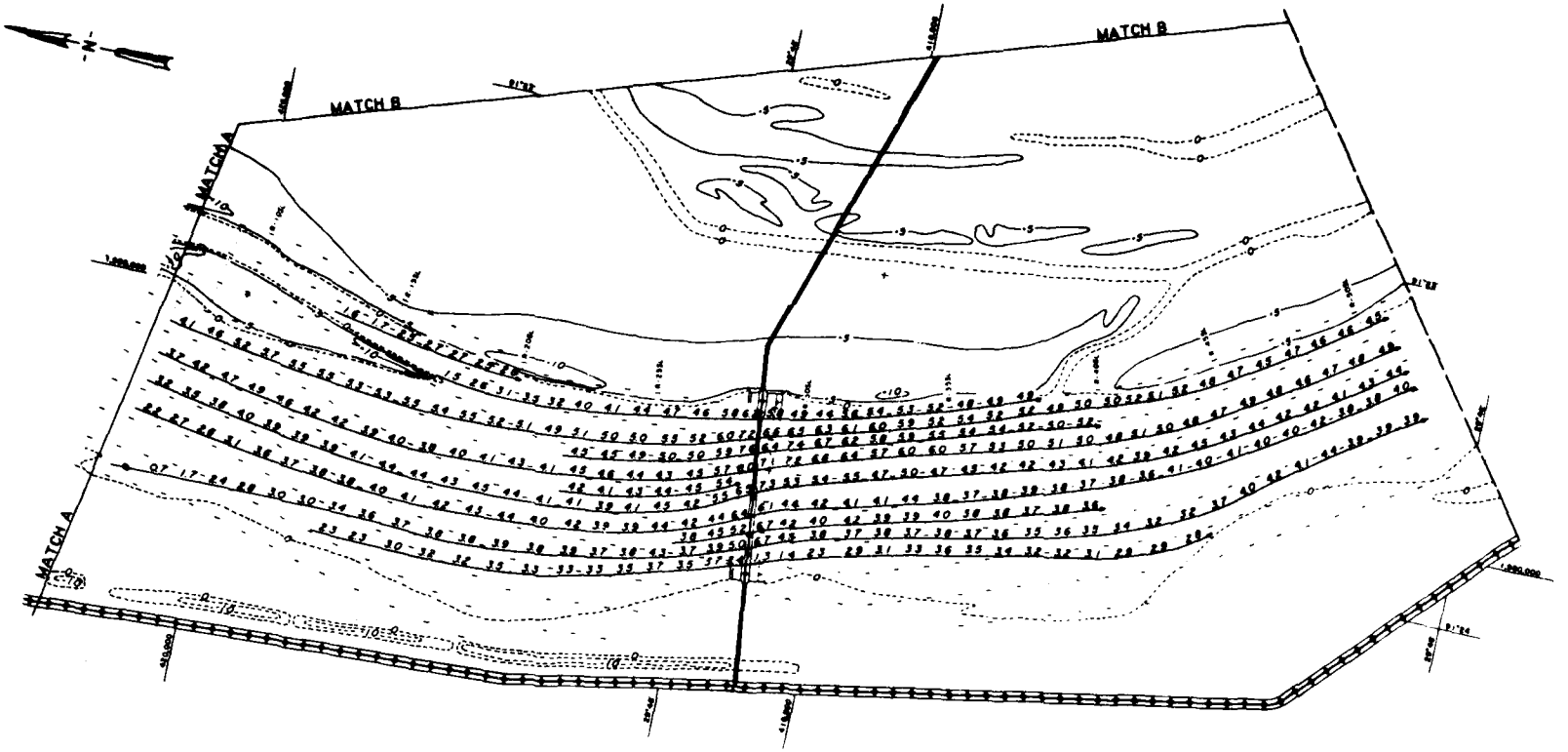
VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE	576,000 CFS
SIX MILE LAKE DISCHARGE	208,500 CFS
VERDUNVILLE STAGE, EL	105 FT

PLATE 25

PLATE 26



LEGEND

FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND

FLOAT VELOCITY LESS THAN 0.5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

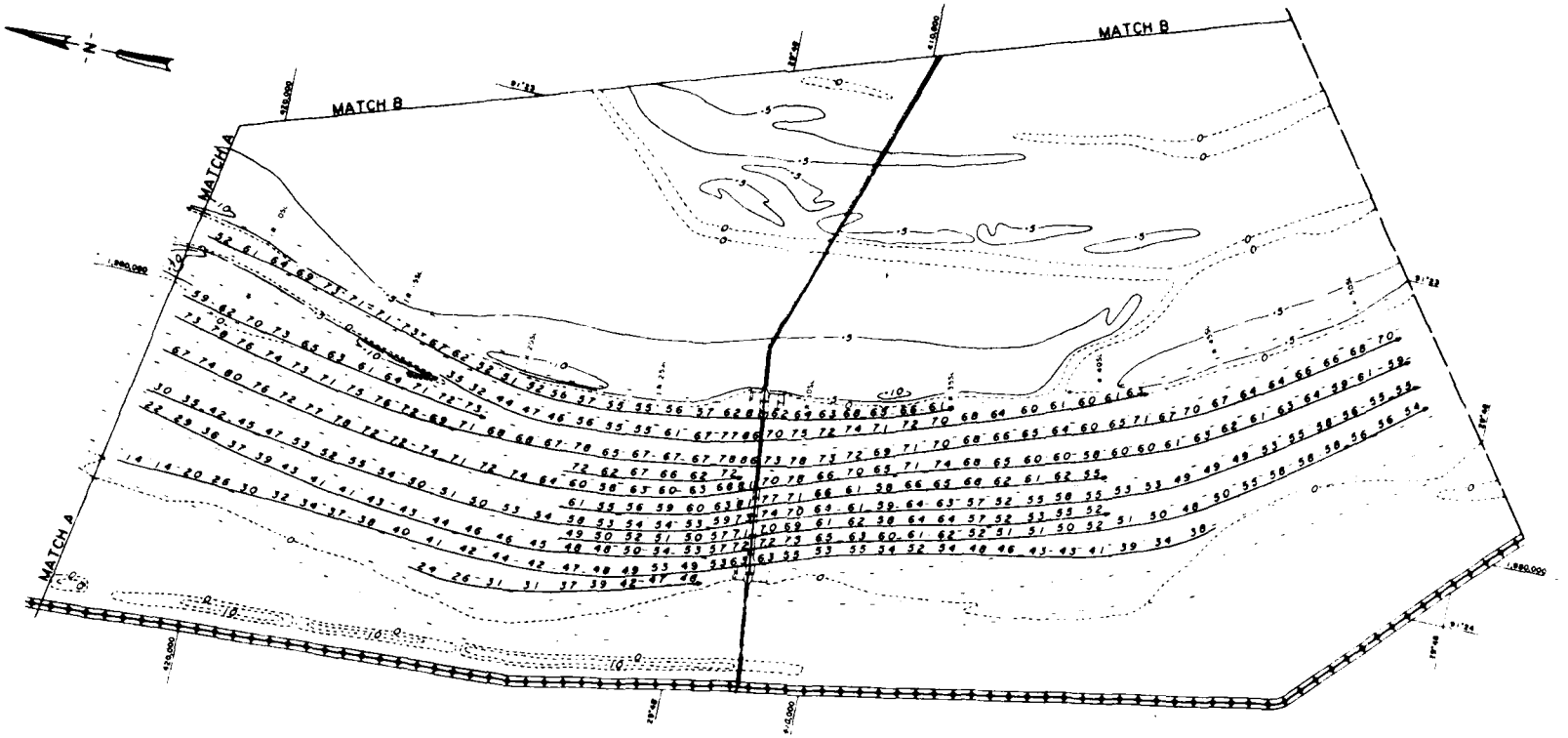
PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE	830,000 CFS
SIX MILE LAKE DISCHARGE	302,100 CFS
VERDUNVILLE STAGE, EL	145 FT



LEGEND

- FLOAT VELOCITY AND DIRECTION IN FEET PER SECOND
- FLOAT VELOCITY LESS THAN 0 5 FEET PER SECOND

NOTE ALL CONTOURS AND ELEVATIONS ARE IN FEET REFERRED TO NGVD

SCALES IN FEET

PROTOTYPE

MODEL

VELOCITIES AND CURRENT DIRECTIONS SIX MILE LAKE REACH

PLAN A-2

MILLER'S POINT DISCHARGE 1,440,000 CFS
SIX MILE LAKE DISCHARGE 496,800 CFS
VERDUNVILLE STAGE, EL 218 FT

PLATE 27